

FIG. 1

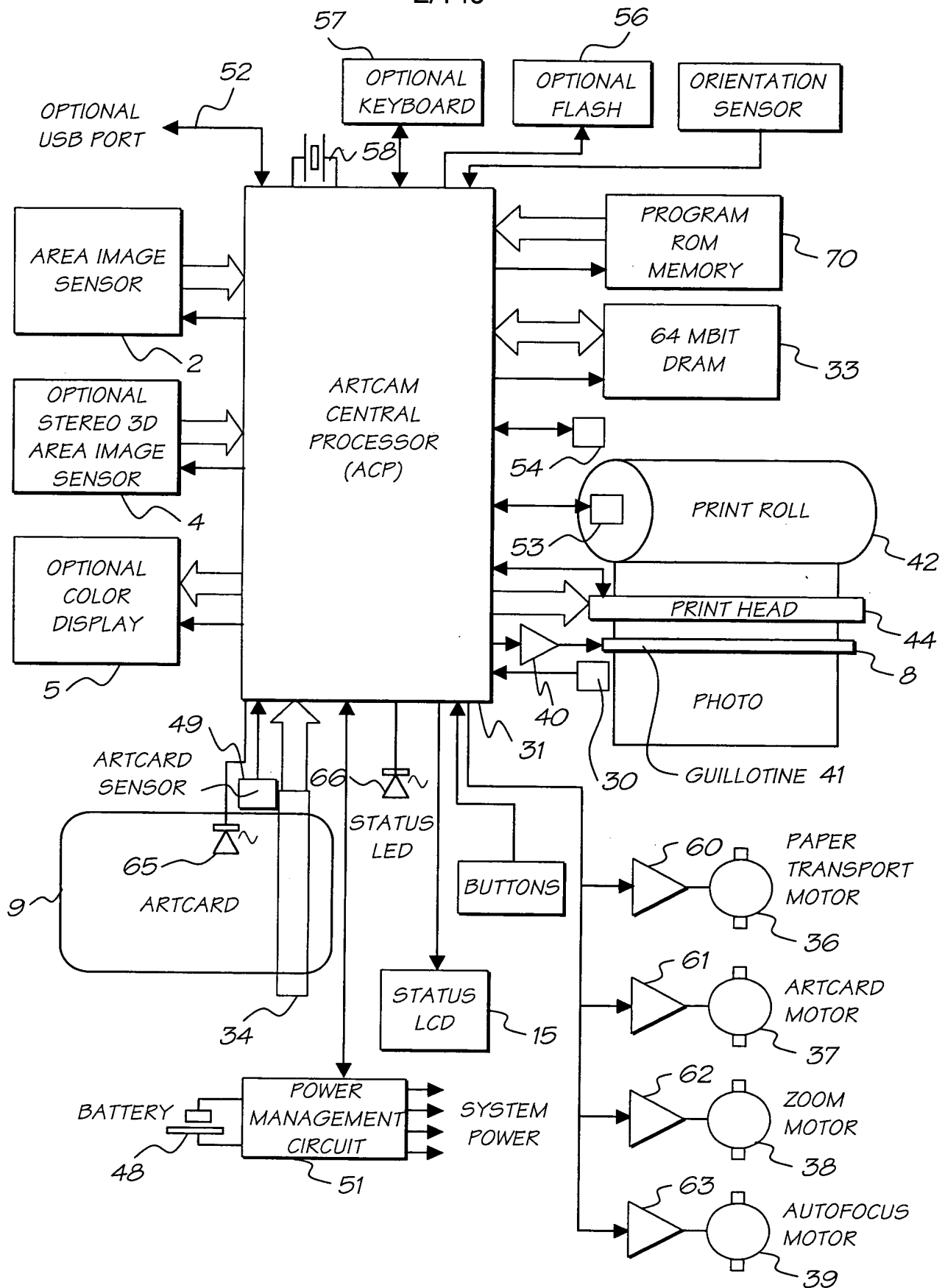


FIG. 2

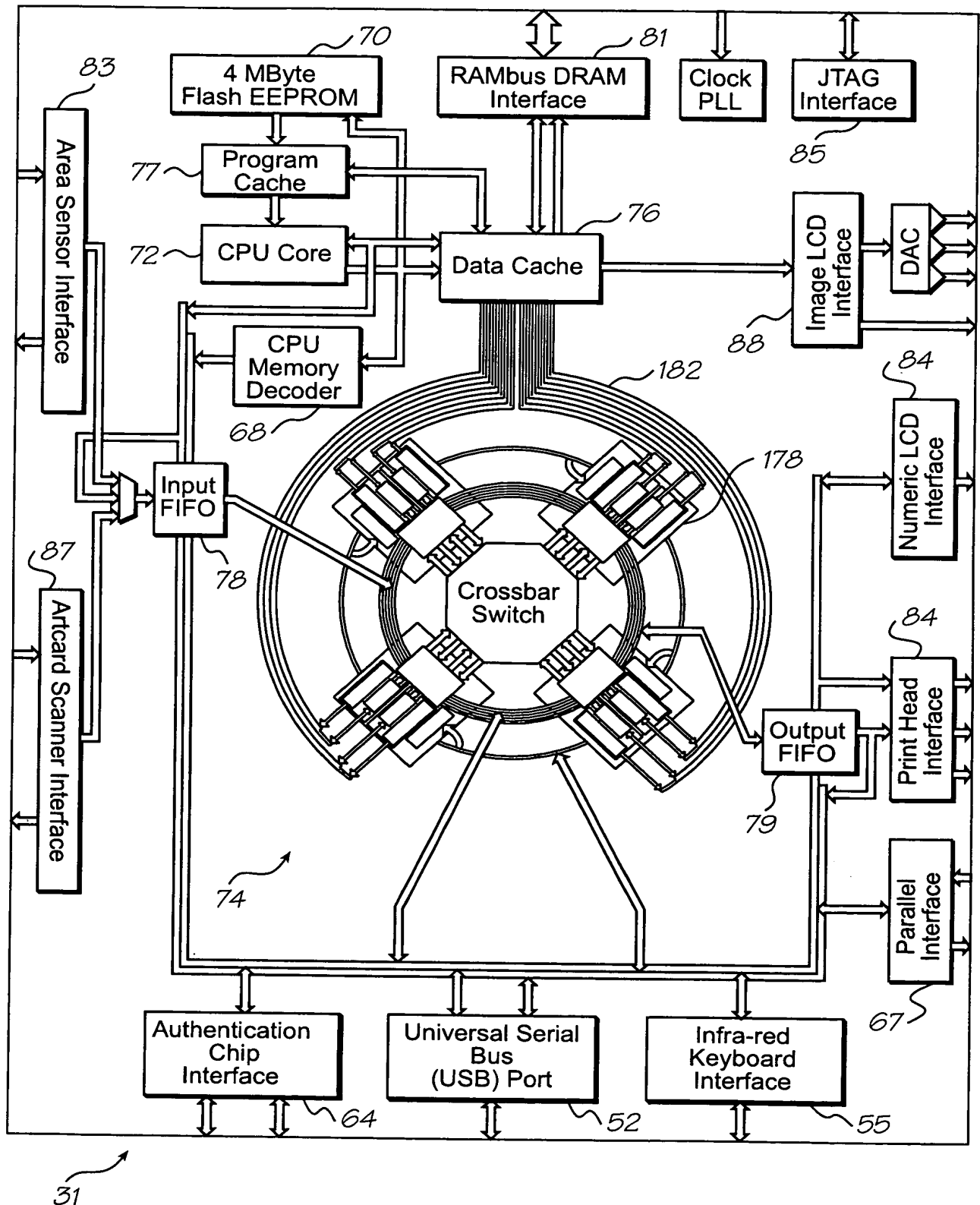


FIG. 3

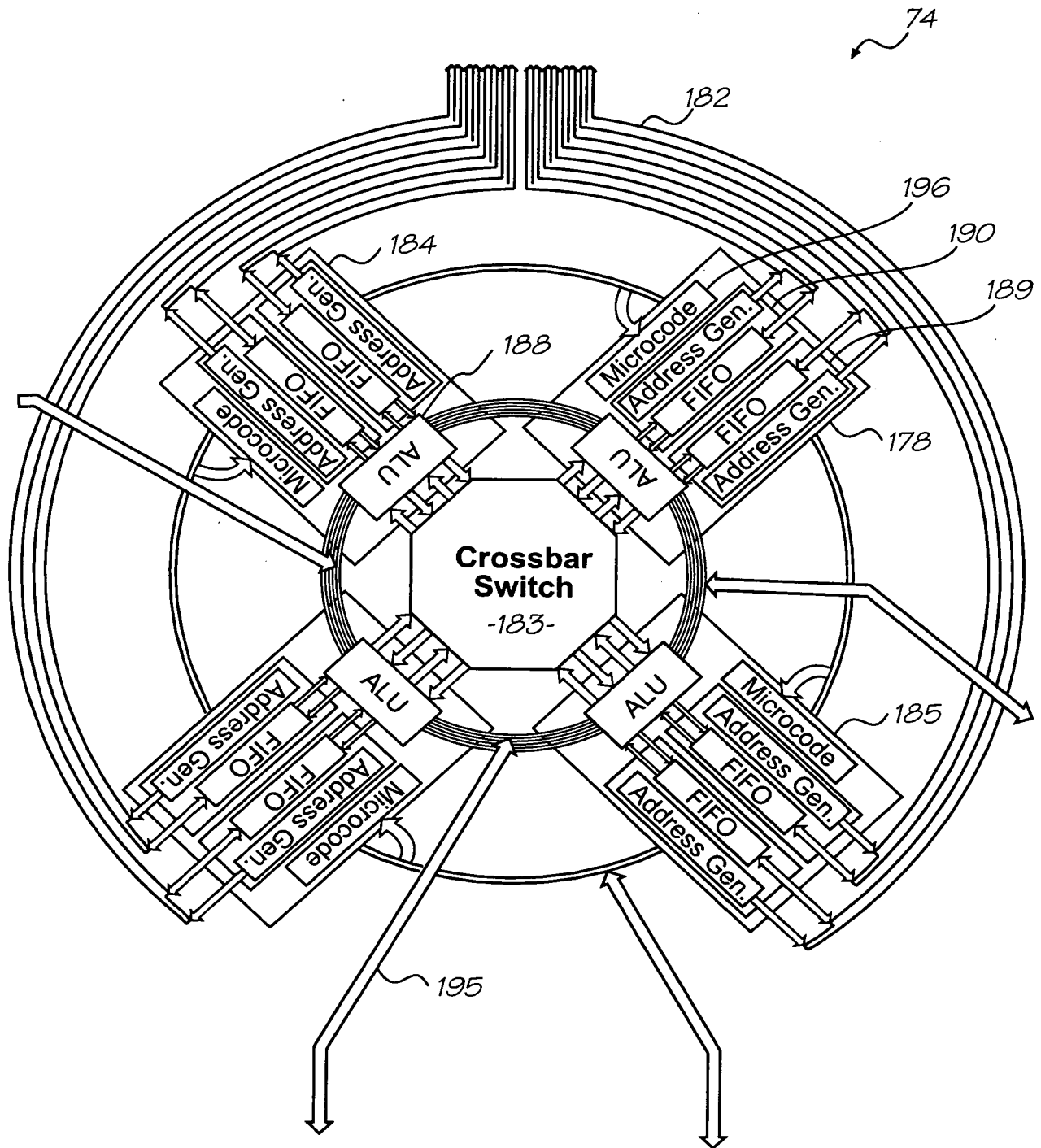
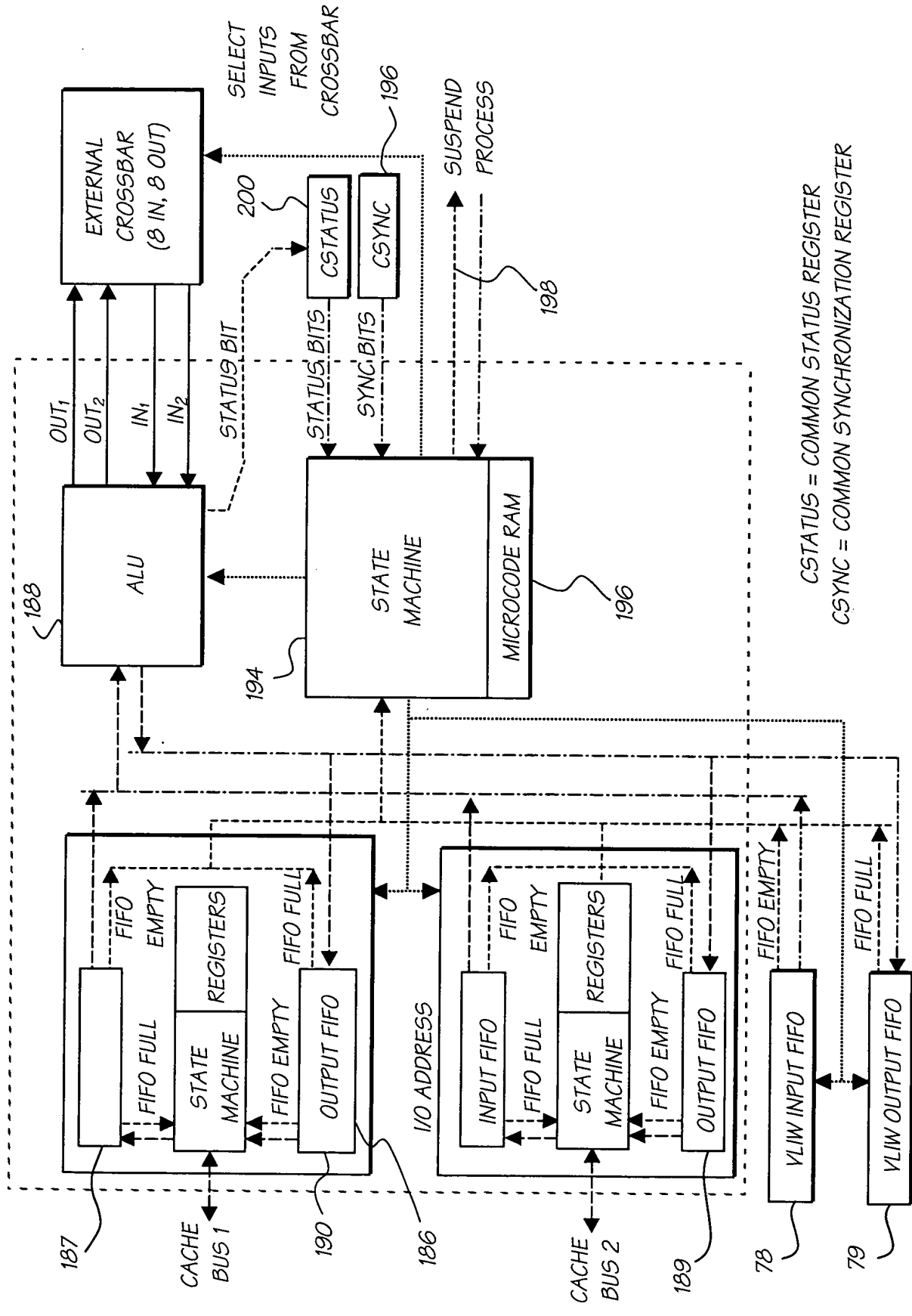


FIG. 3(a)



CSTATUS = COMMON STATUS REGISTER
CSYNC = COMMON SYNCHRONIZATION REGISTER

FIG. 4

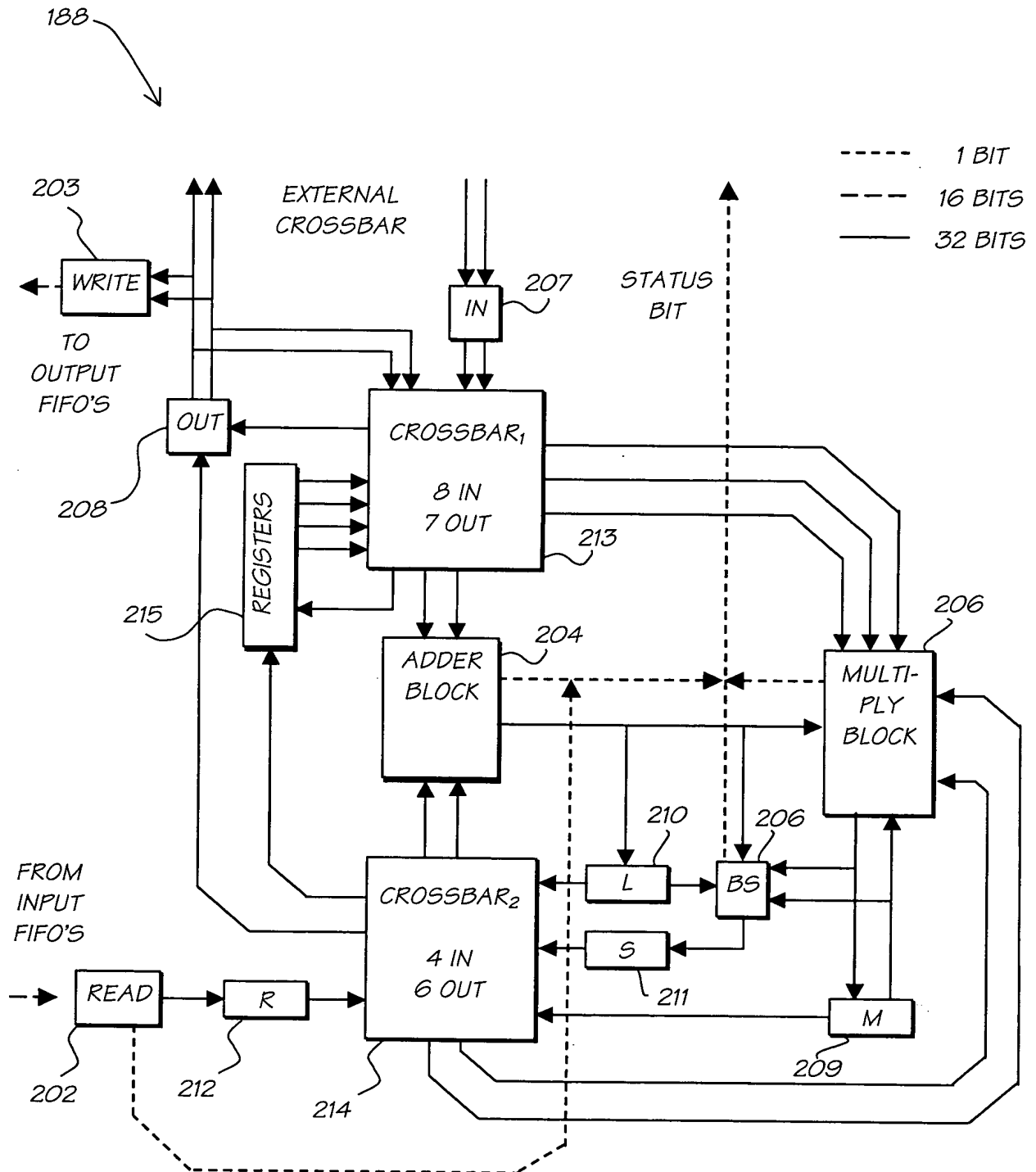


FIG. 5

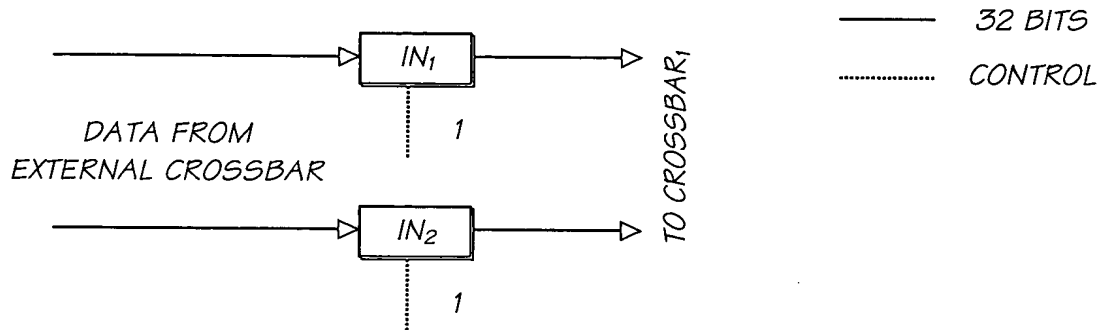


FIG. 6

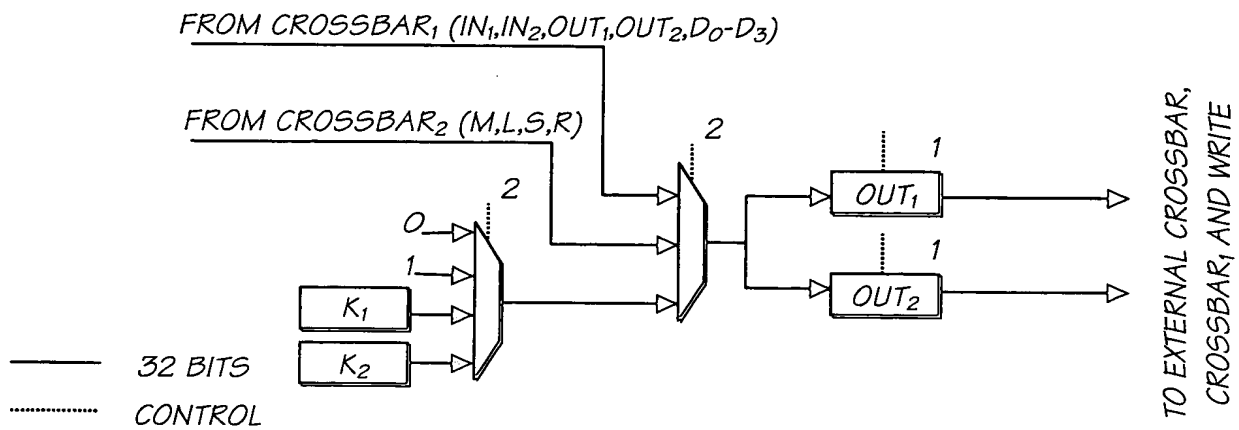


FIG. 7

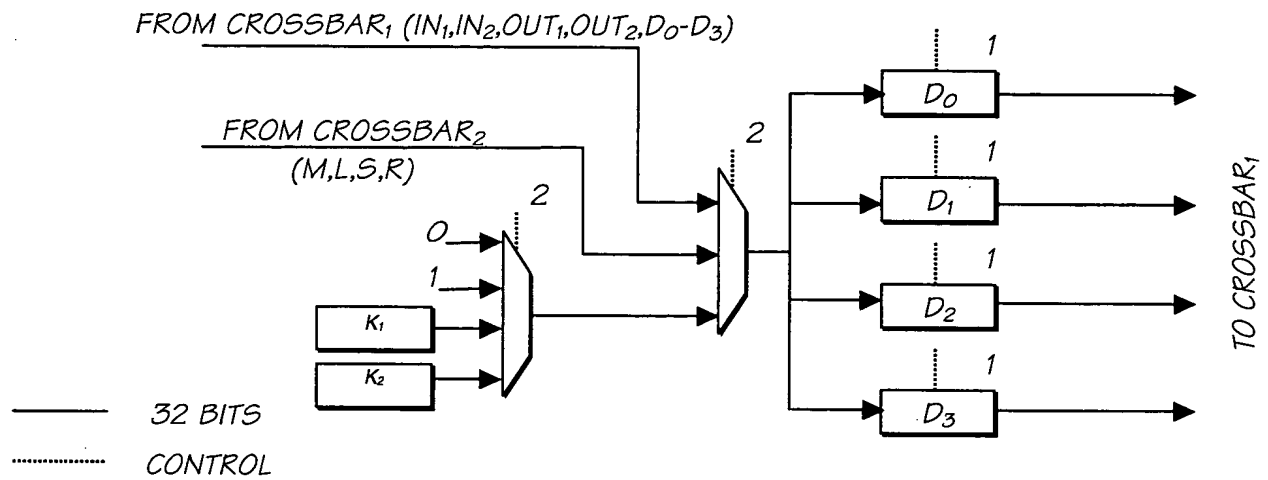


FIG. 8

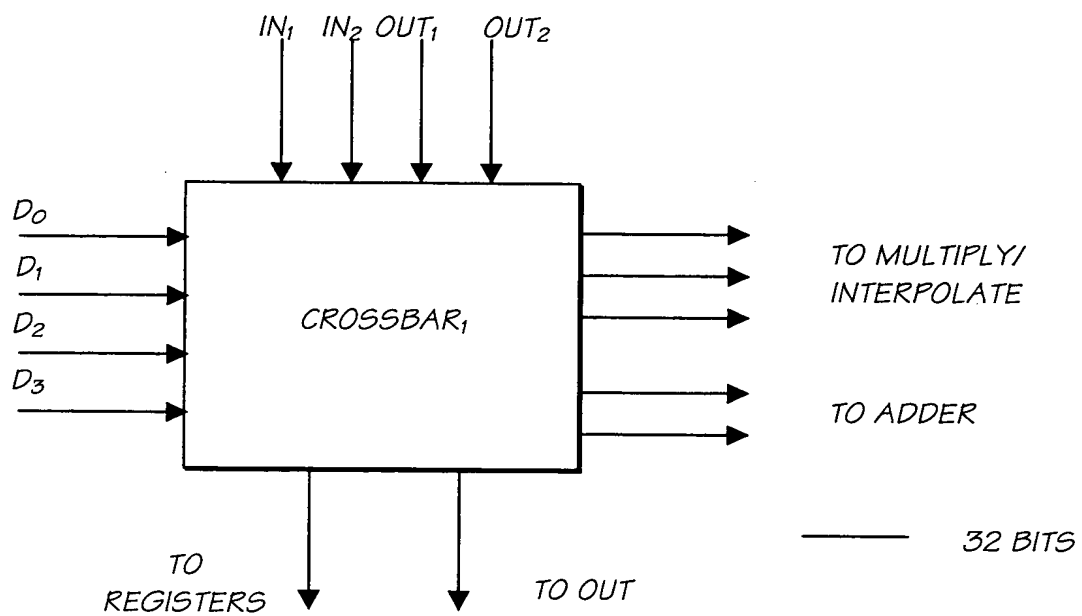


FIG. 9

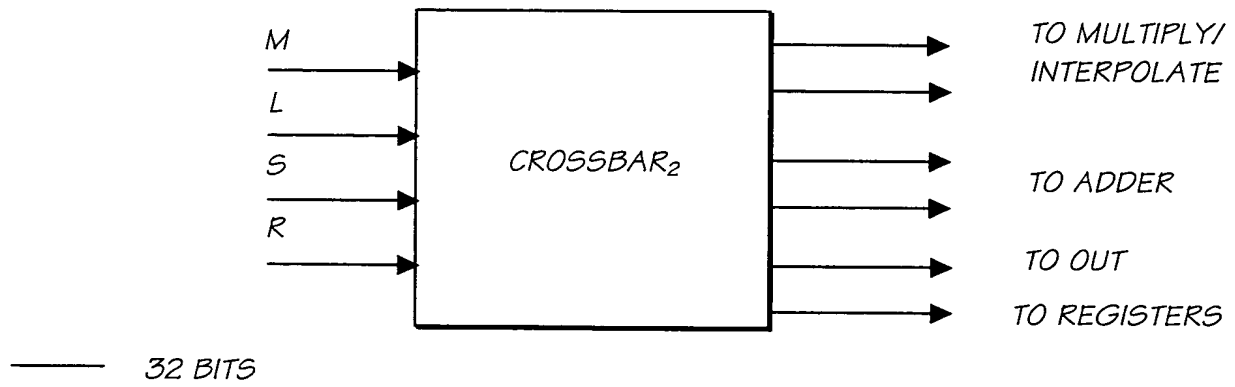


FIG. 10

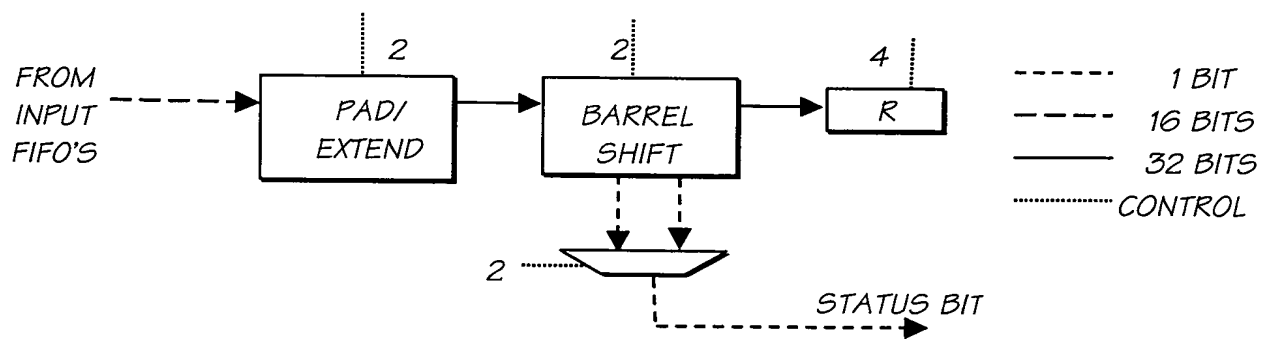


FIG. 11

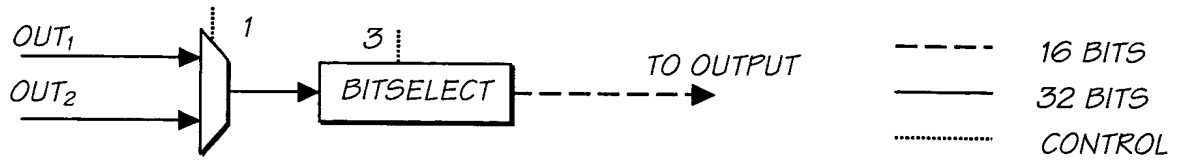


FIG. 12

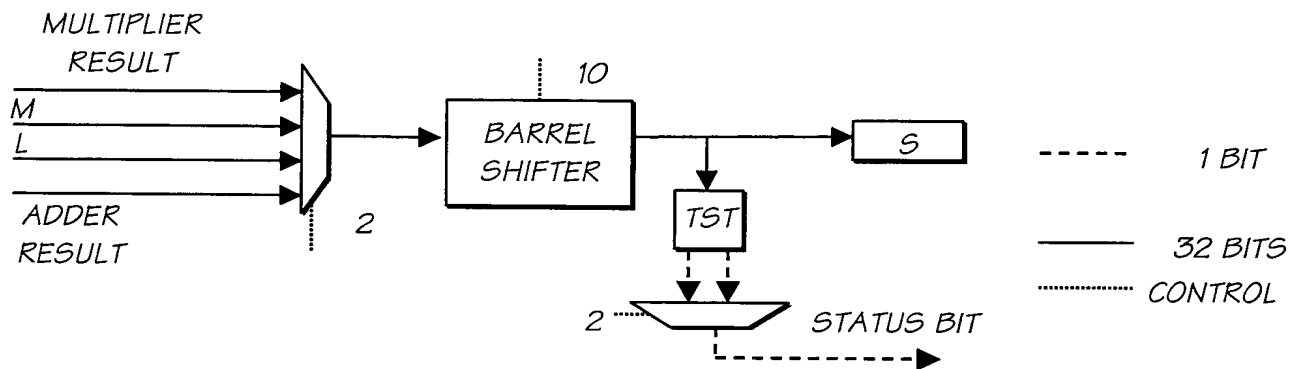


FIG. 13

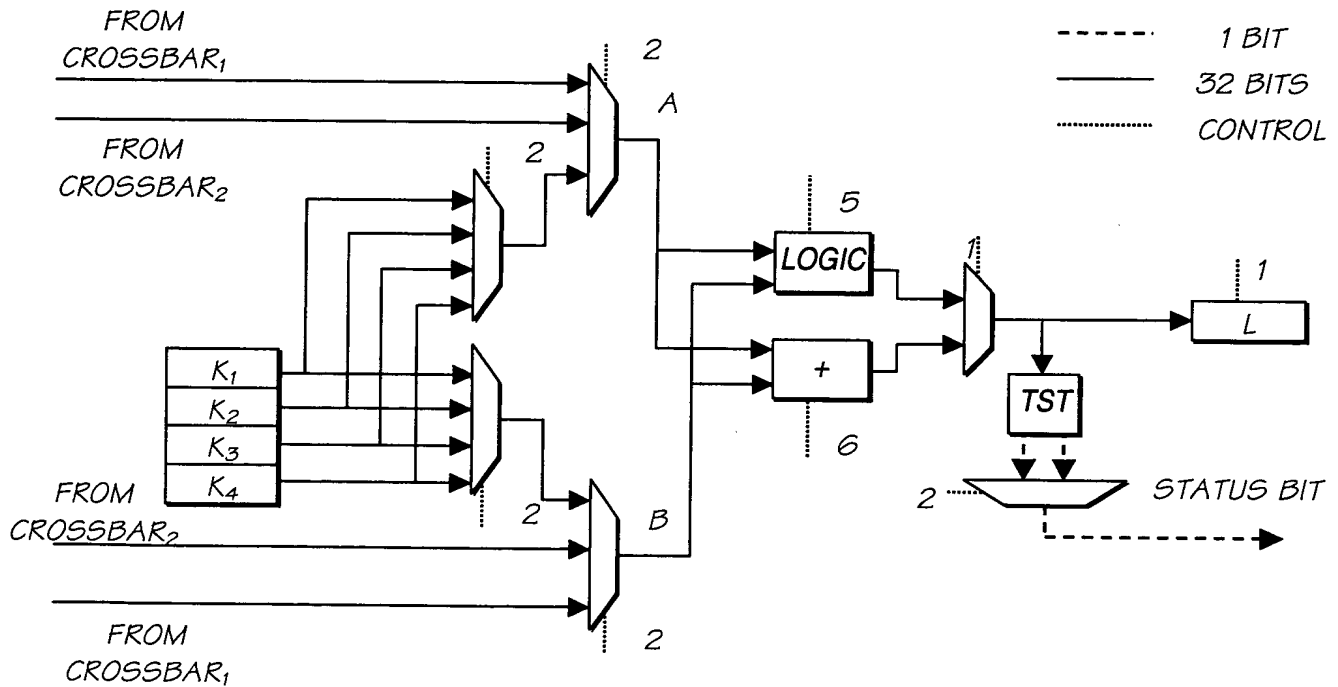


FIG. 14

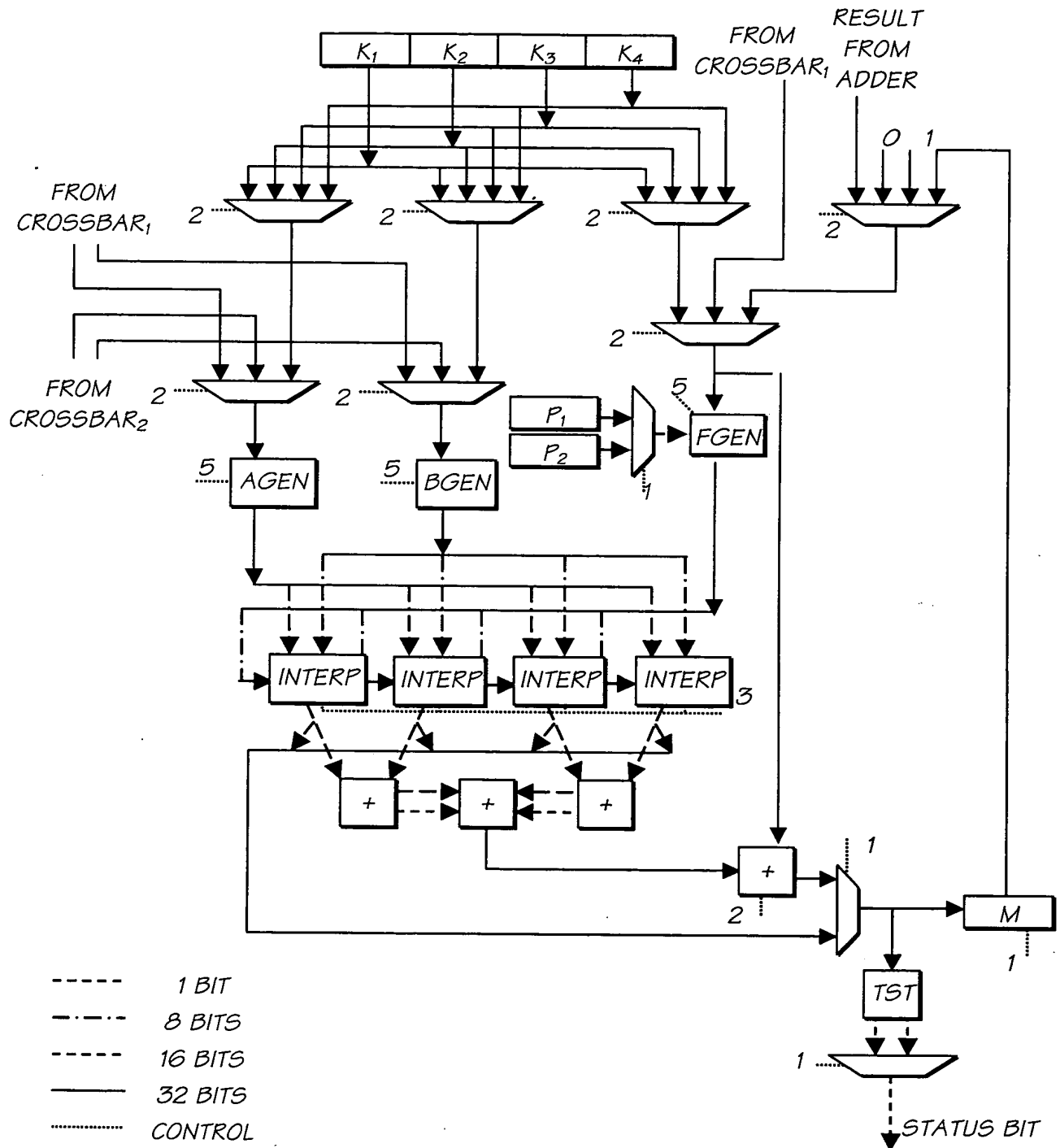


FIG. 15

12/140

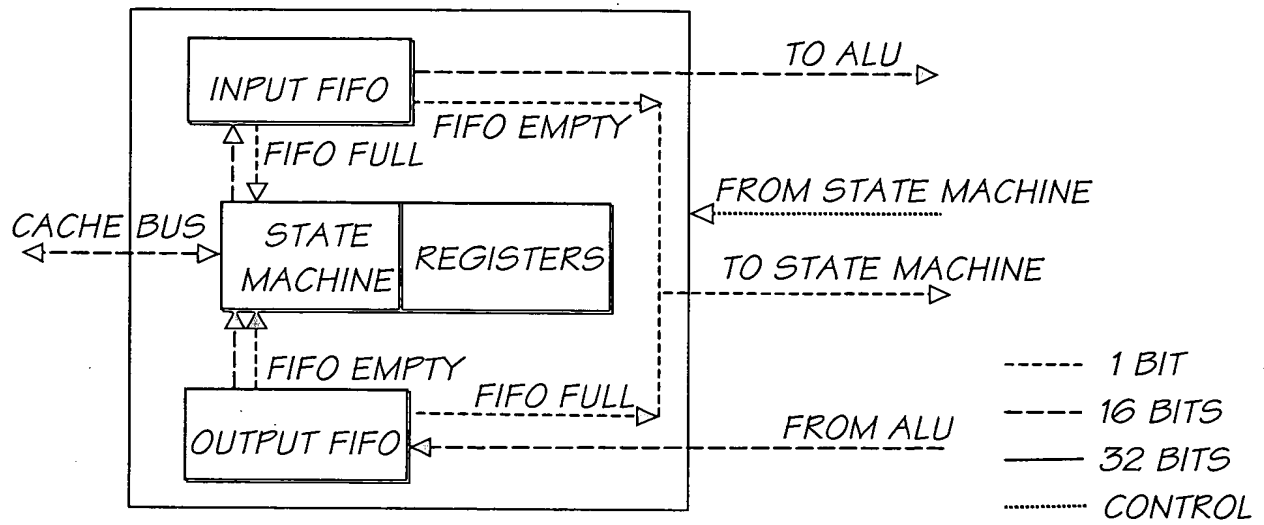


FIG. 16

ORDER OF PIXELS PRESENTED BY A SEQUENTIAL READ ITERATOR
ON A 4 X 2 IMAGE WITH PADDING.

0	1	2	3	
4	5	6	7	

FIG. 17

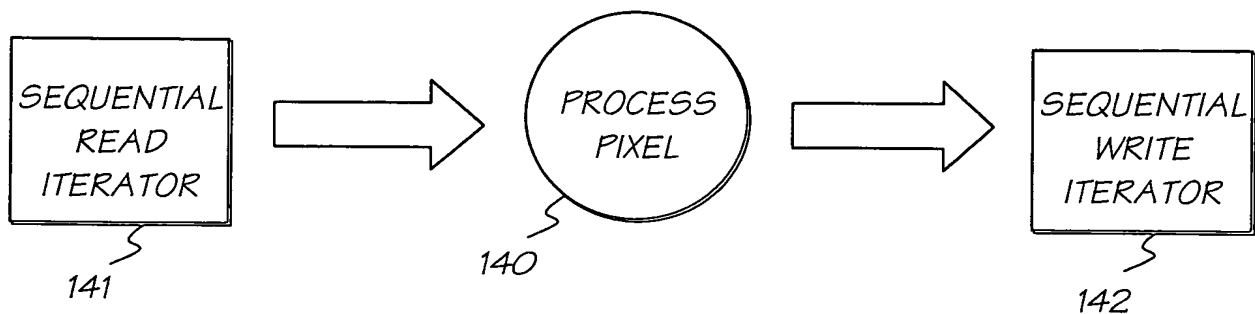
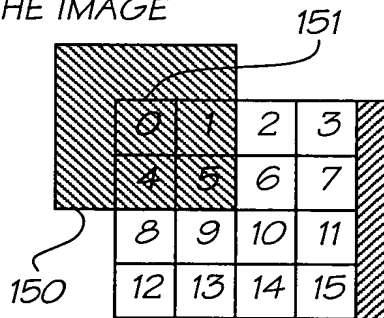


FIG. 18

A 3x3 BOX VIEW TRAVERSES THE PIXELS IN ORDER: 0, 1, 2, 3, 4, 5, 6, 7, 8
ETC, PLACING A 3x3 BOX CENTERED OVER EACH PIXEL...

3x3 BOX VIEW OF FIRST
PIXEL IN IMAGE = 9 PIXELS,
5 OF WHICH ARE OUTSIDE
THE IMAGE

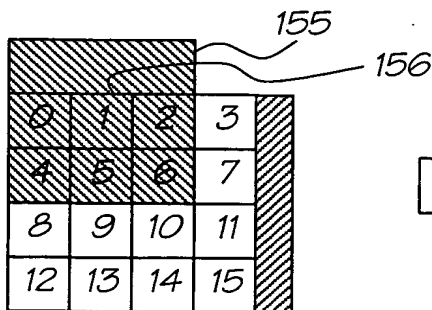


FIRST 9 PIXELS FROM THE BOX
READ ITERATOR:

IF DUPLICATION OF EDGE PIXELS IS
ON: 0, 0, 0, 0, 0, 1, 4, 4, 5

IF DUPLICATION OF EDGE PIXELS IS
OFF: V, V, V, V, V, 0, 1, V, 4, 5
WHERE V IS CONSTANT PIXEL
REGISTER VALUE REPRESENTING
"OUTSIDE THE IMAGE"

3x3 BOX VIEW OF
SECOND PIXEL IN IMAGE
= 9 PIXELS,
3 OF WHICH ARE
OUTSIDE THE IMAGE



SECOND 9 PIXELS FROM THE BOX
READ ITERATOR:

IF DUPLICATION OF EDGE PIXELS
IS ON: 0, 1, 2, 0, 1, 2, 4, 5, 6

IF DUPLICATION OF EDGE PIXELS
IS OFF: V, V, V, V, V, 0, 1, 2, 4, 5, 6
WHERE V IS CONSTANT PIXEL
REGISTER VALUE REPRESENTING
"OUTSIDE THE IMAGE"

FIG. 19

14/140

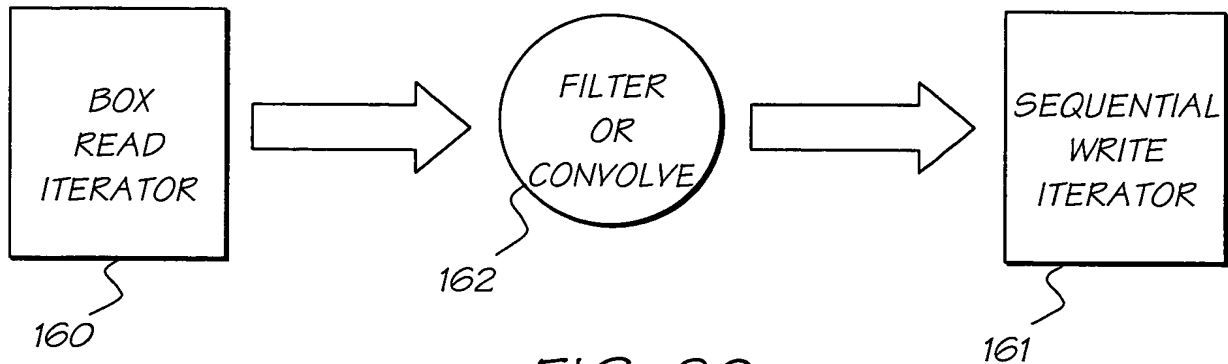
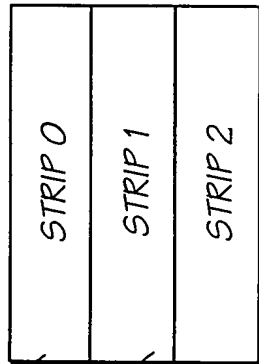
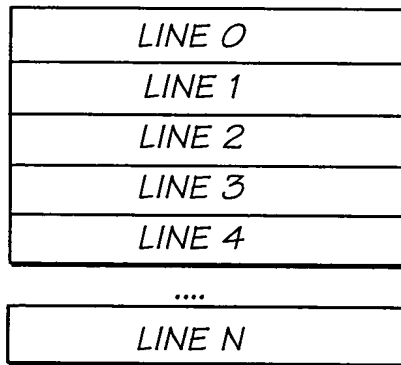


IMAGE BROKEN INTO
VERTICAL STRIPS,
EACH STRIP IS 32
PIXELS ACROSS



LINES ARE ACCESSED
LINE 0 TO LINE N
WITHIN A SINGLE STRIP.



PIXELS ARE ACCESSED
PIXEL 0 - PIXEL 31
WITHIN A SINGLE LINE

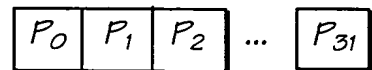


FIG. 21

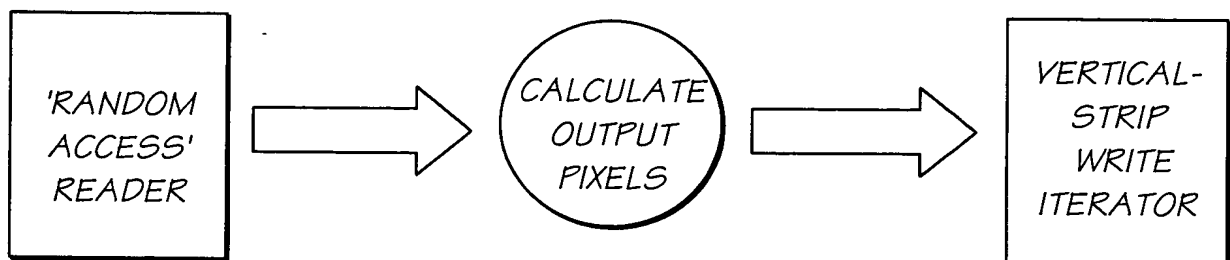


FIG. 22

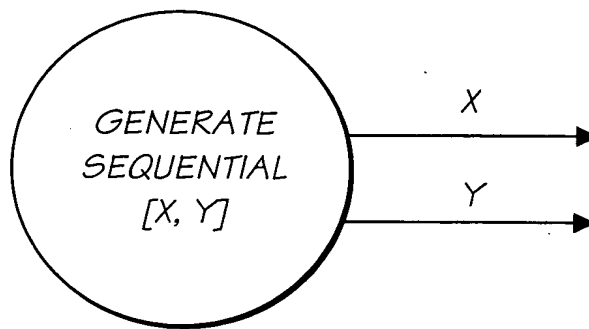


FIG. 23

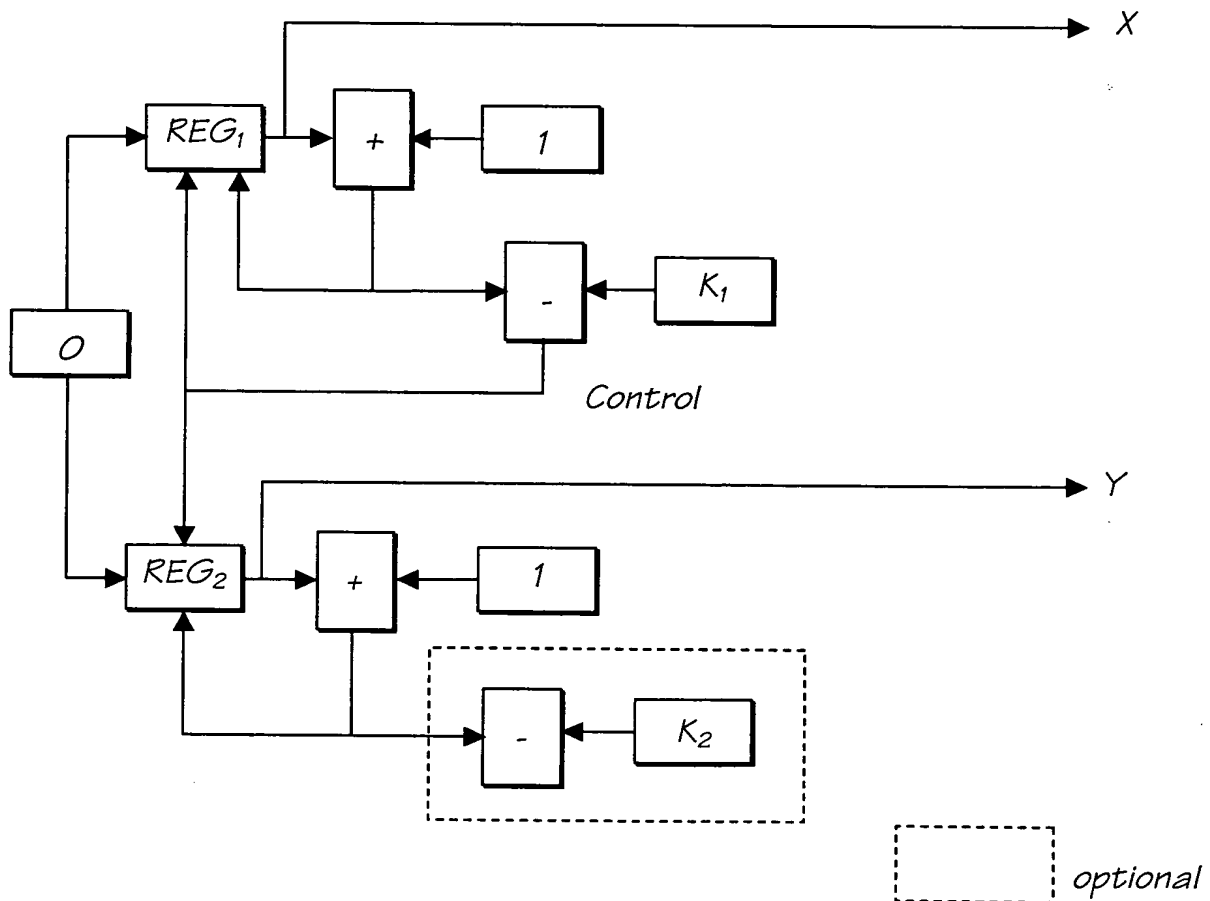


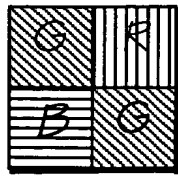
FIG. 24

The diagram illustrates a digital control system for a two-mass mechanical system. It features four registers: REG_1 , REG_2 , REG_3 , and REG_4 . The system is initialized with zero values in REG_1 and REG_4 . The control logic involves several feedback loops and gain blocks:

- REG_1 is updated by a sum of its current value and a gain K_1 multiplied by the output X .
- REG_2 is updated by a sum of its current value, a constant 1, and a gain K_2 multiplied by the output Y .
- REG_3 is updated by a sum of its current value and a gain K_2 multiplied by the output Y .
- REG_4 is updated by a sum of its current value, a constant 1, and a gain K_3 multiplied by the output Y .

The outputs X and Y are determined by the values in REG_2 and REG_4 respectively, after being processed by a MIN block and a gain K_1 .

FIG. 26



2X2 PIXEL BLOCK FROM SENSOR

FIG. 27

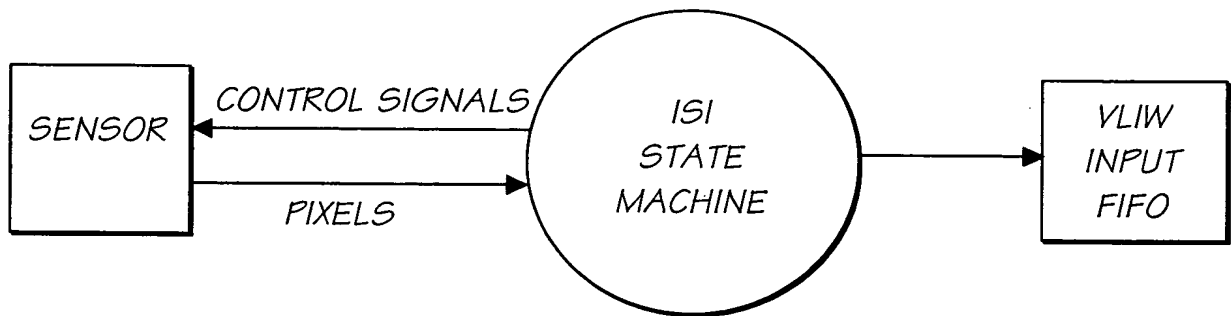


FIG. 28

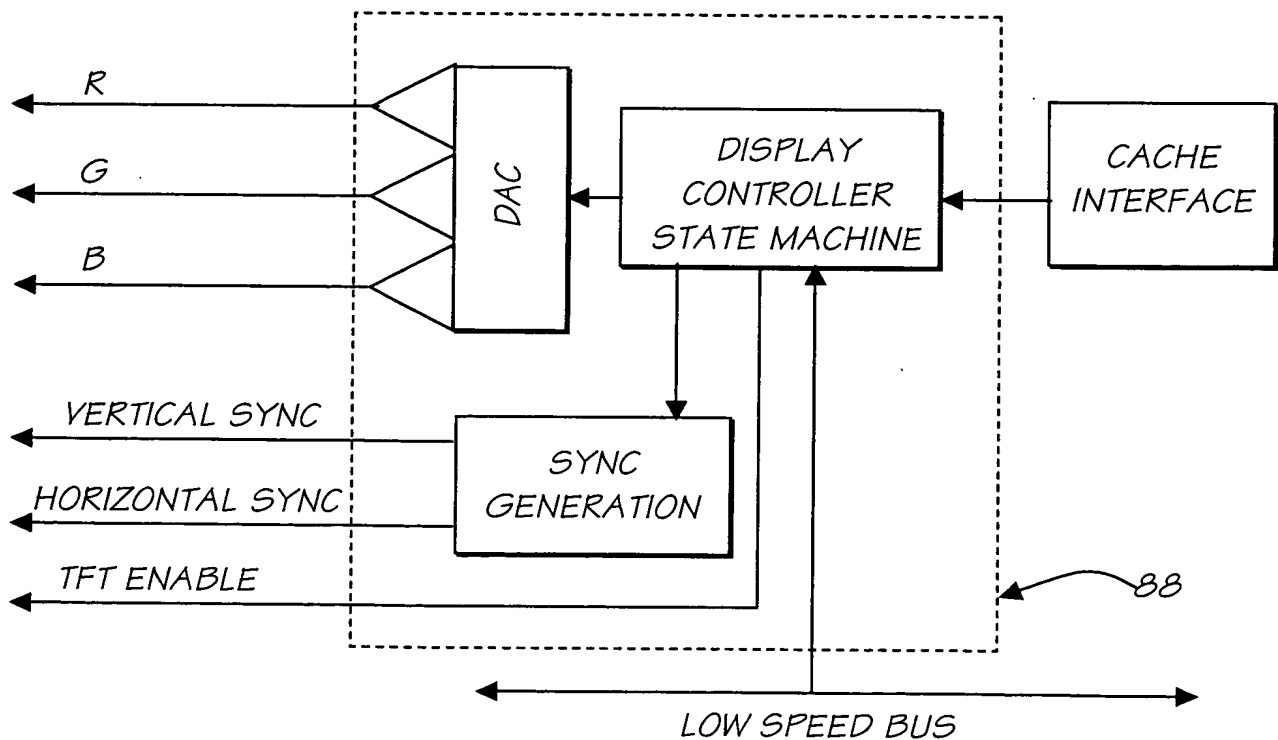
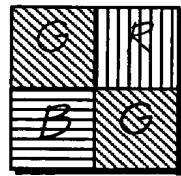


FIG. 29



2X2 PIXEL BLOCK FROM CCD

FIG. 30

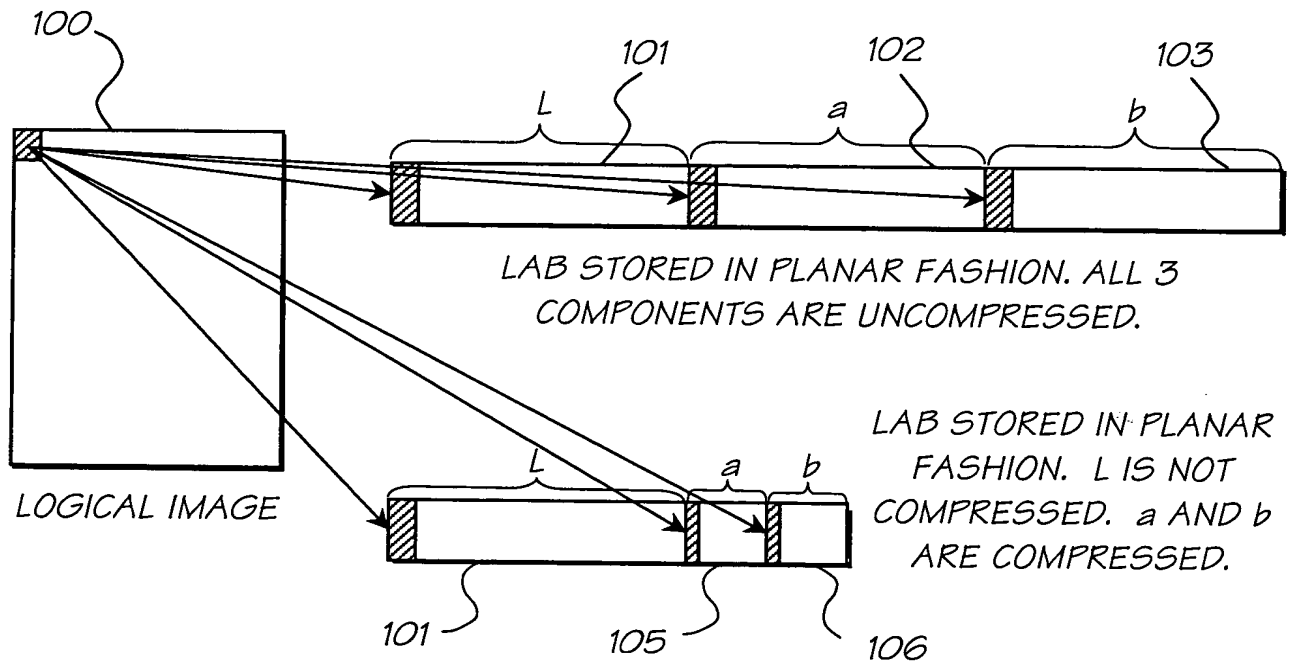


FIG. 31

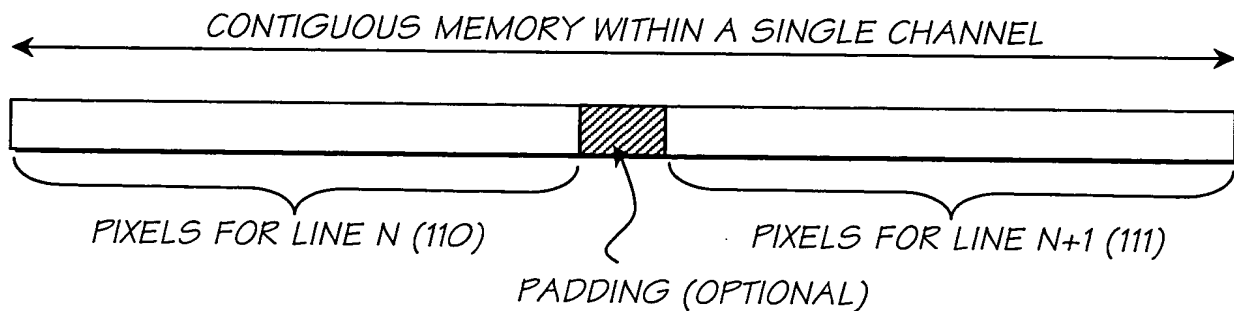


FIG. 32

19/140

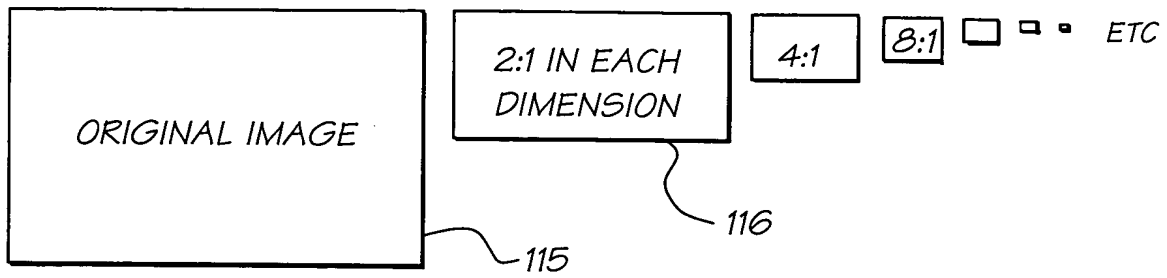


FIG. 33

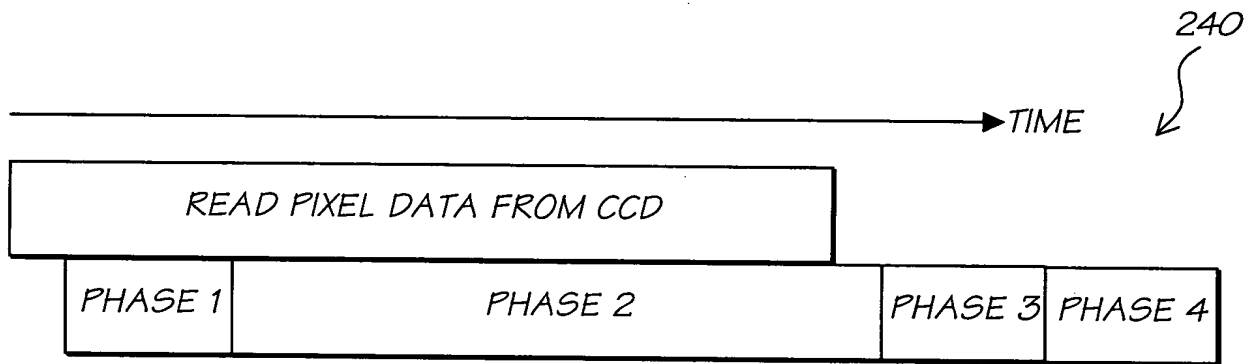


FIG. 34

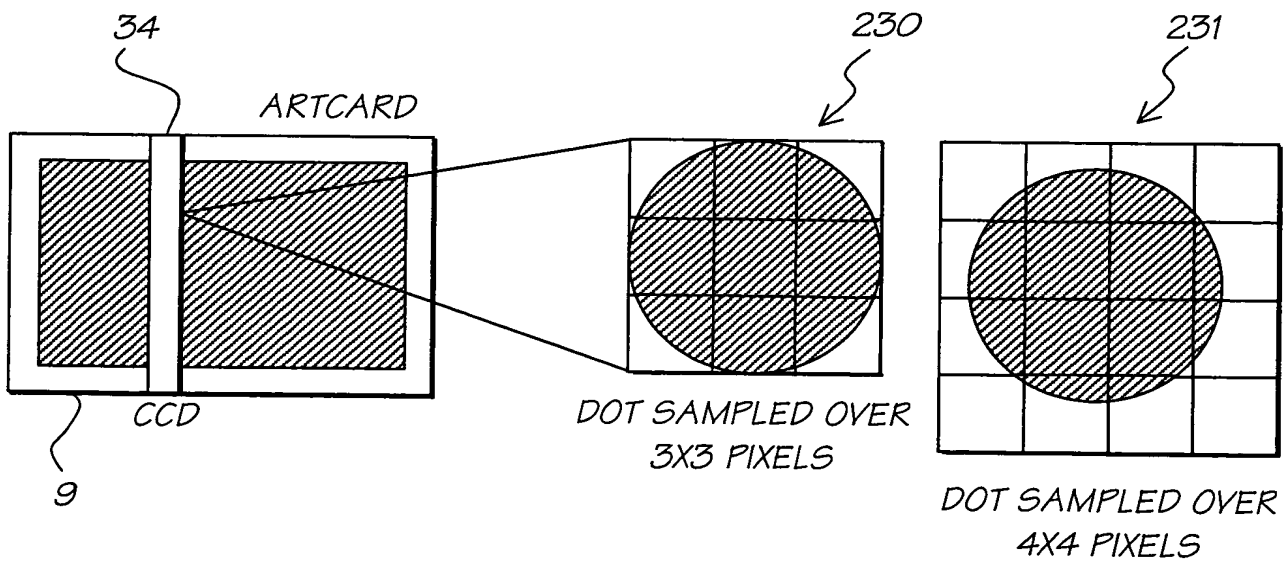


FIG. 35

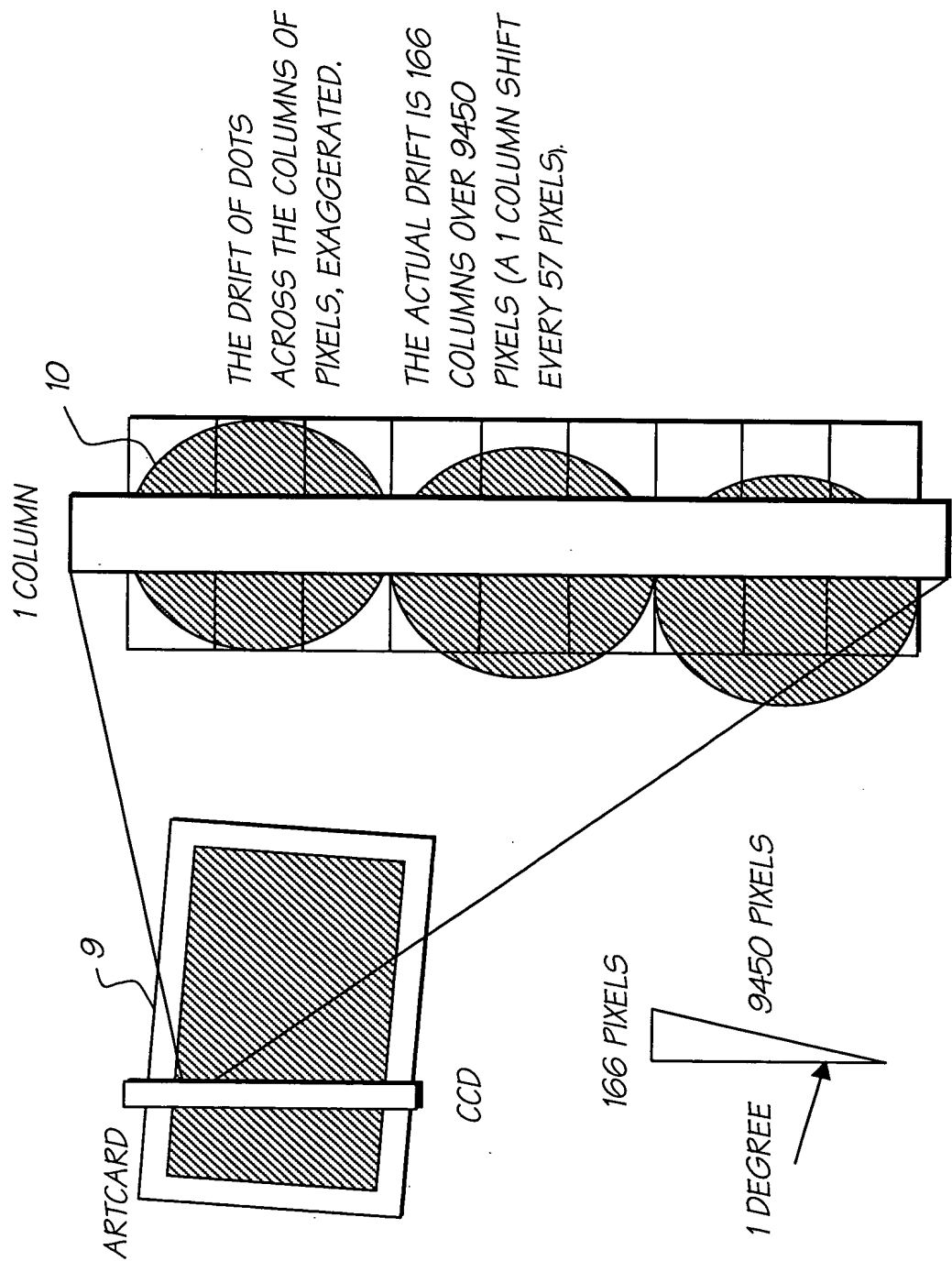


FIG. 36

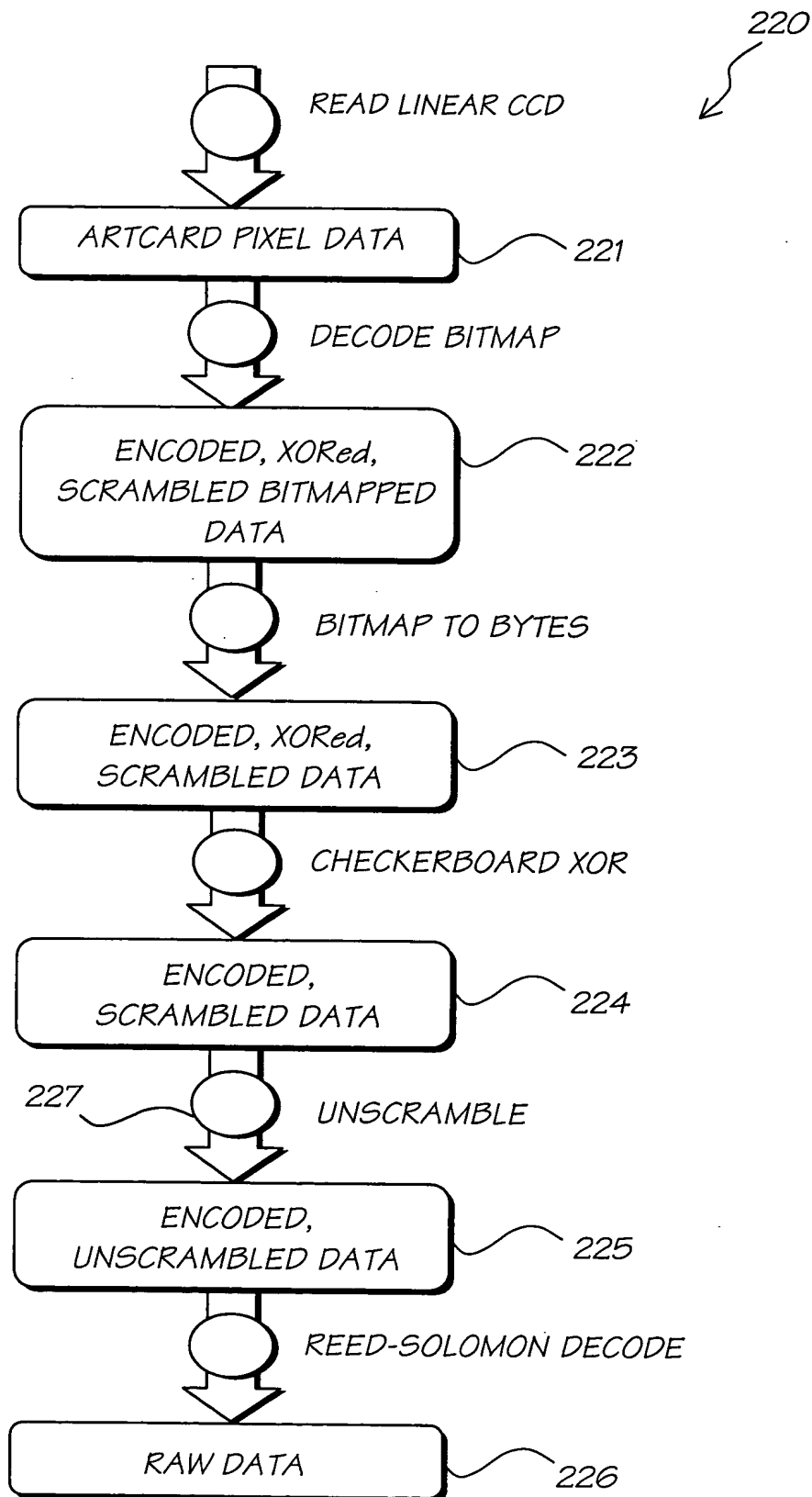


FIG. 37

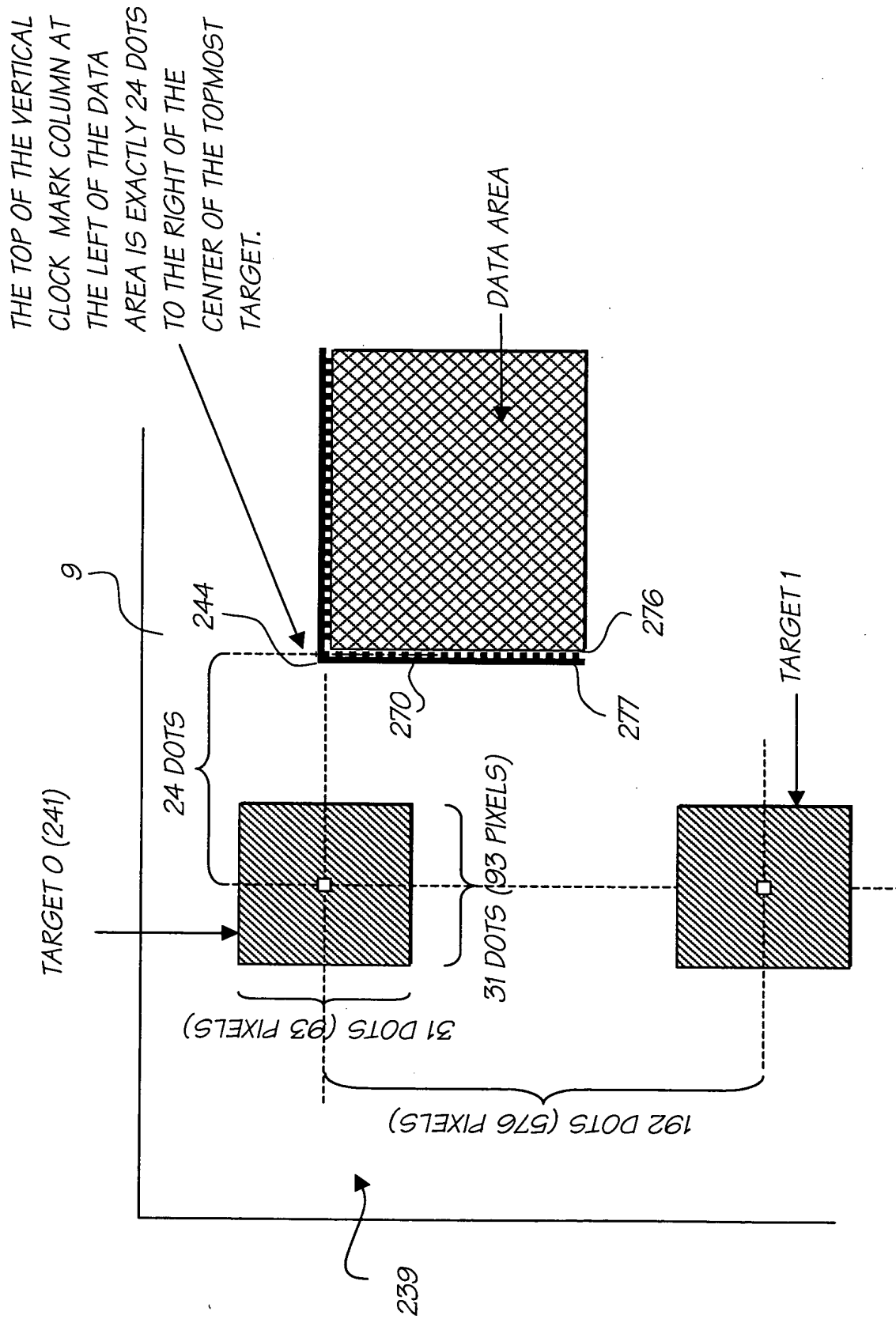


FIG. 38

23/140

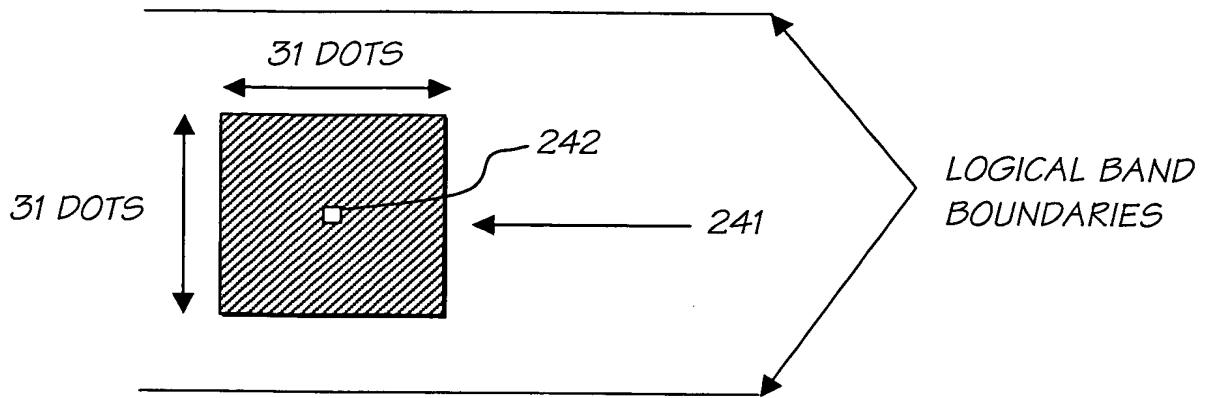


FIG. 39

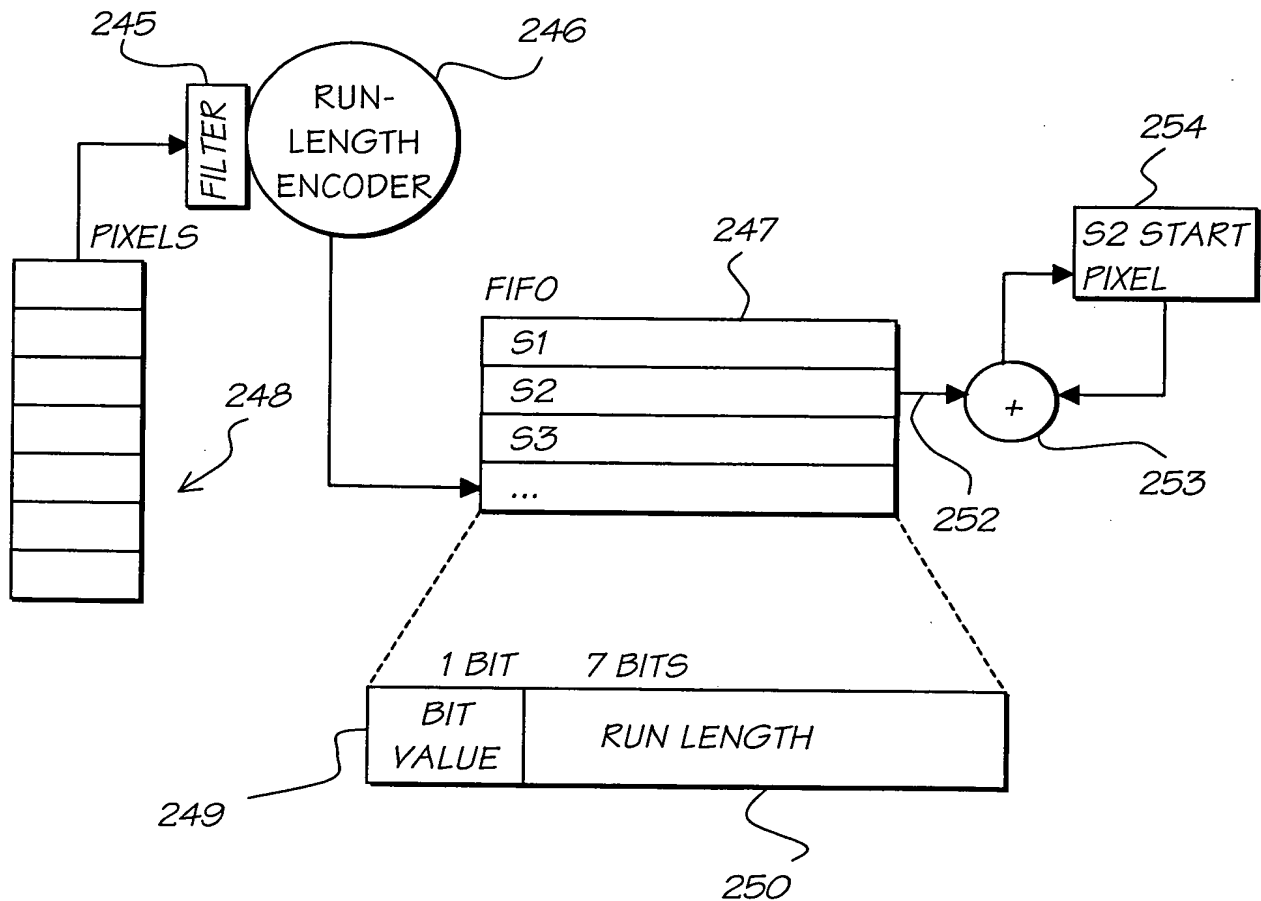


FIG. 40

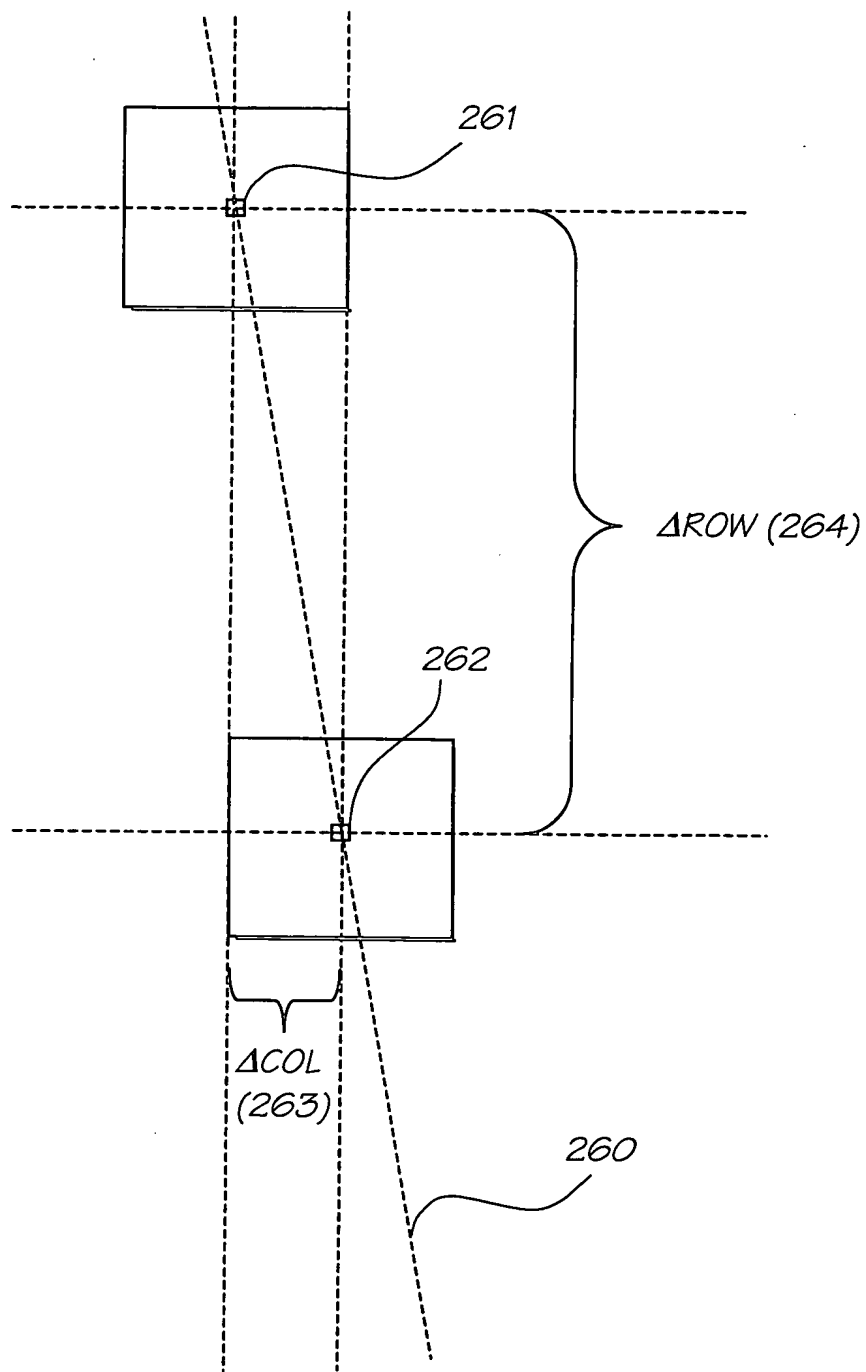


FIG. 41

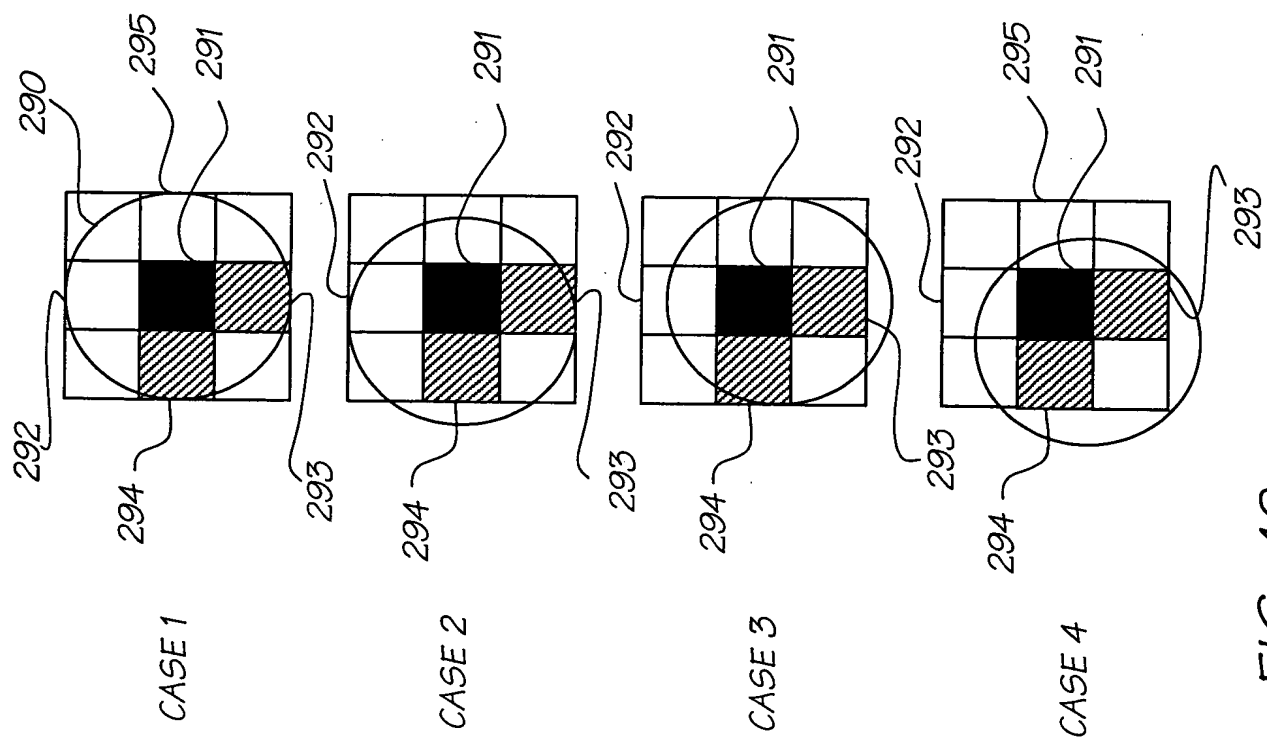


FIG. 42

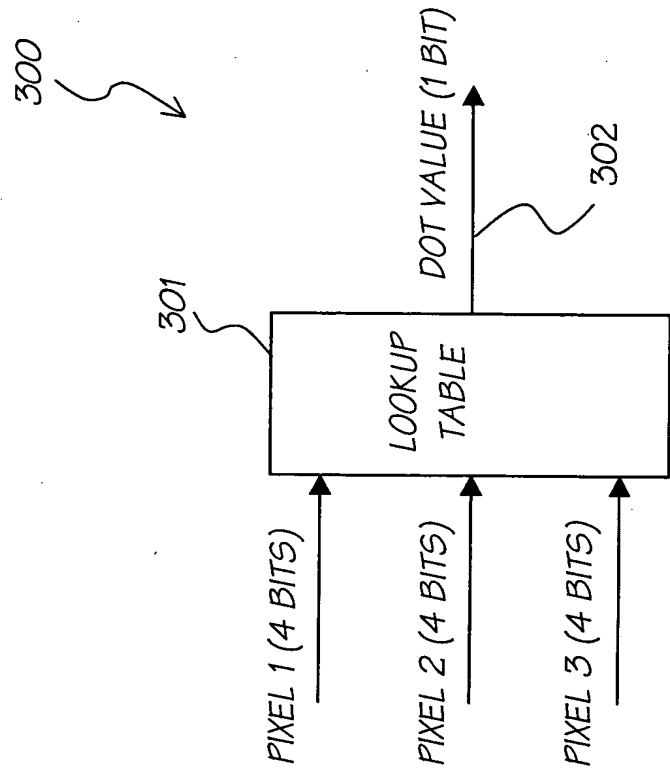


FIG. 43

26/140

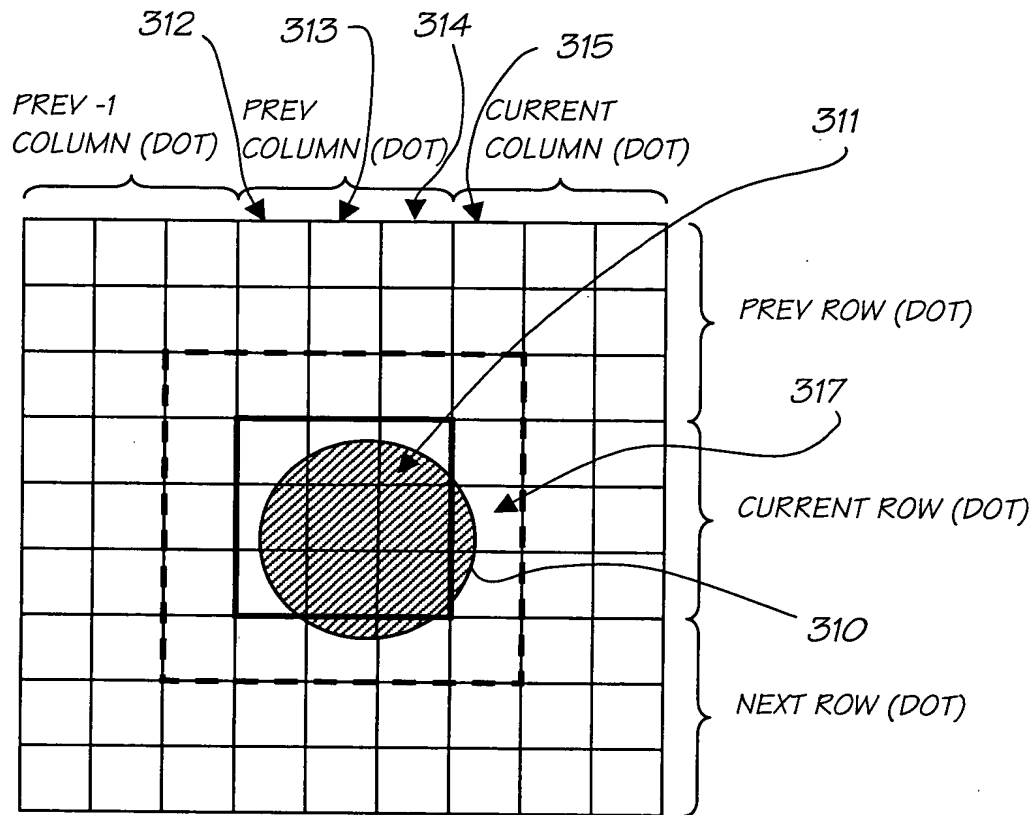


FIG. 44

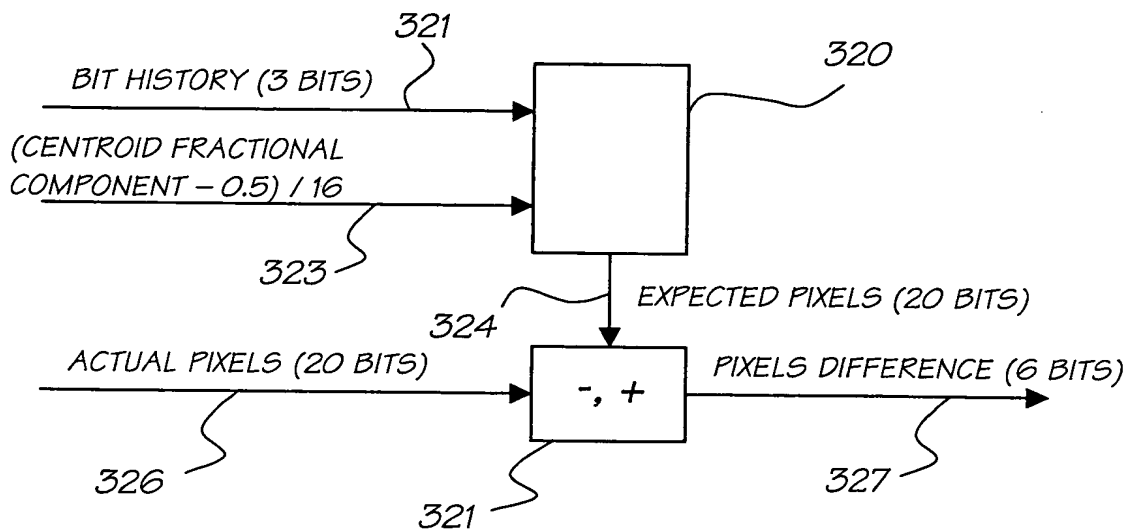


FIG. 45

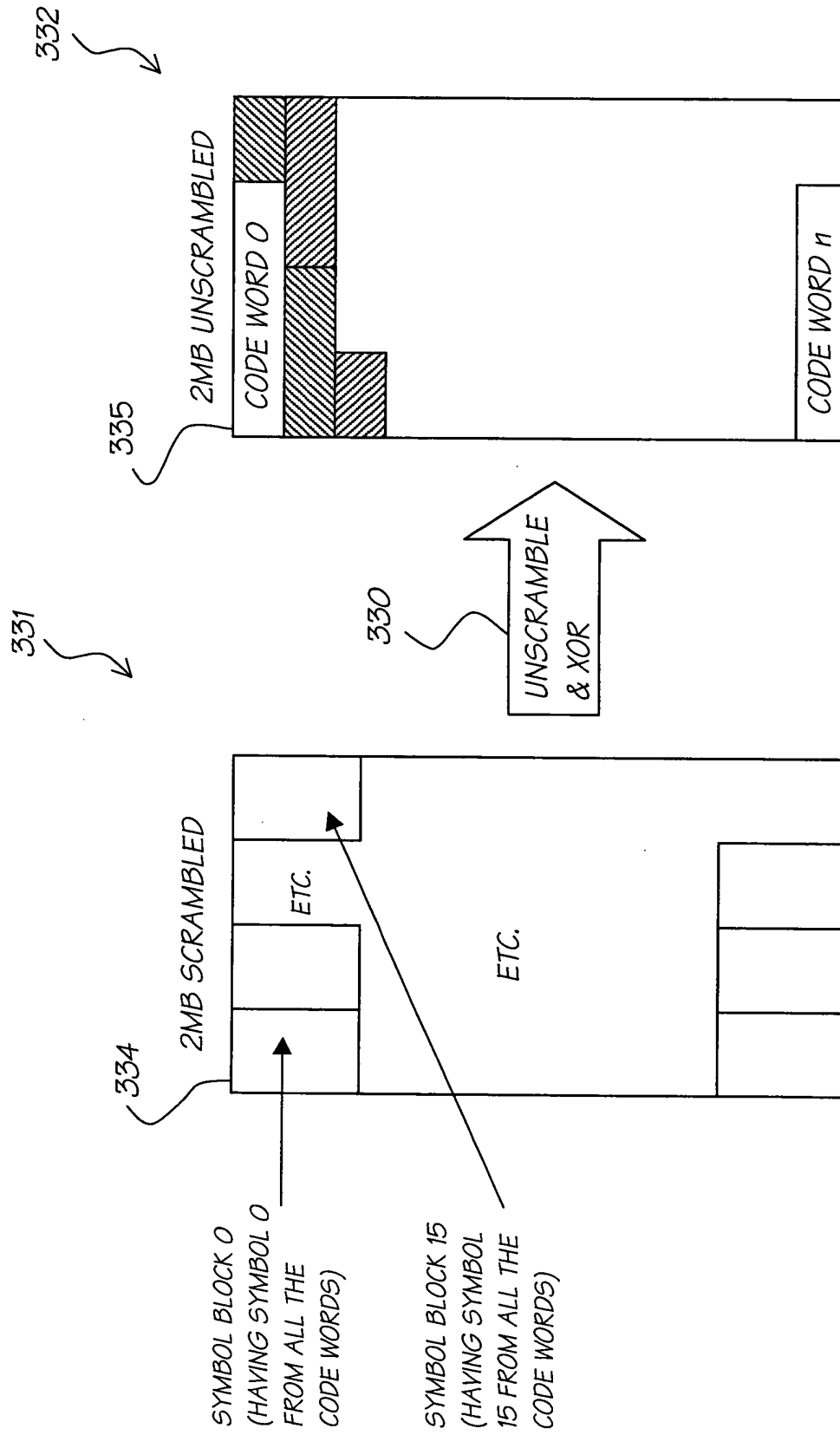
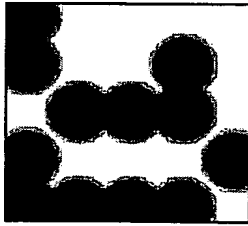
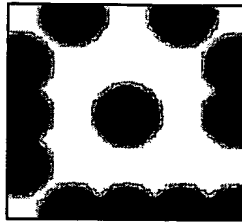


FIG. 46



BLACK AND WHITE
DOTS



BLACK DOT
SURROUNDED
BY WHITE



WHITE DOT
SURROUNDED
BY BLACK

FIG. 47

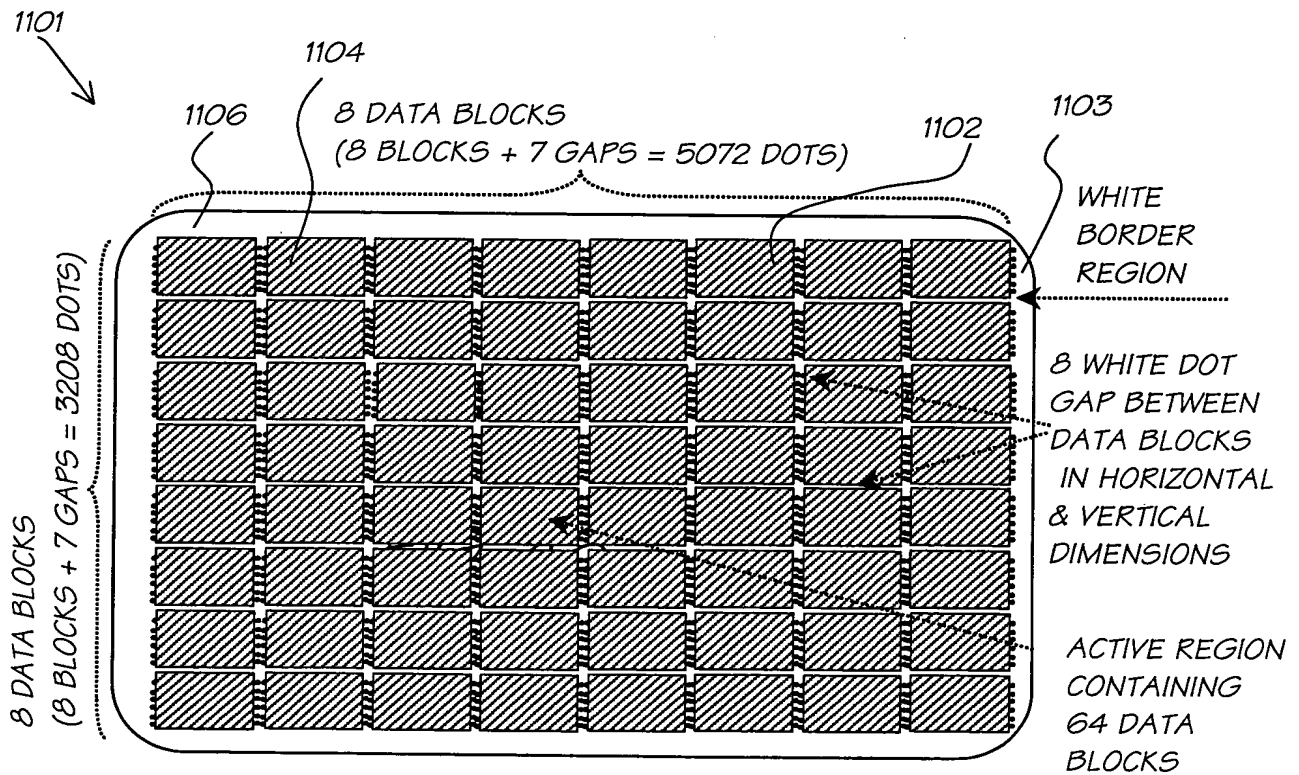


FIG. 48

29/140

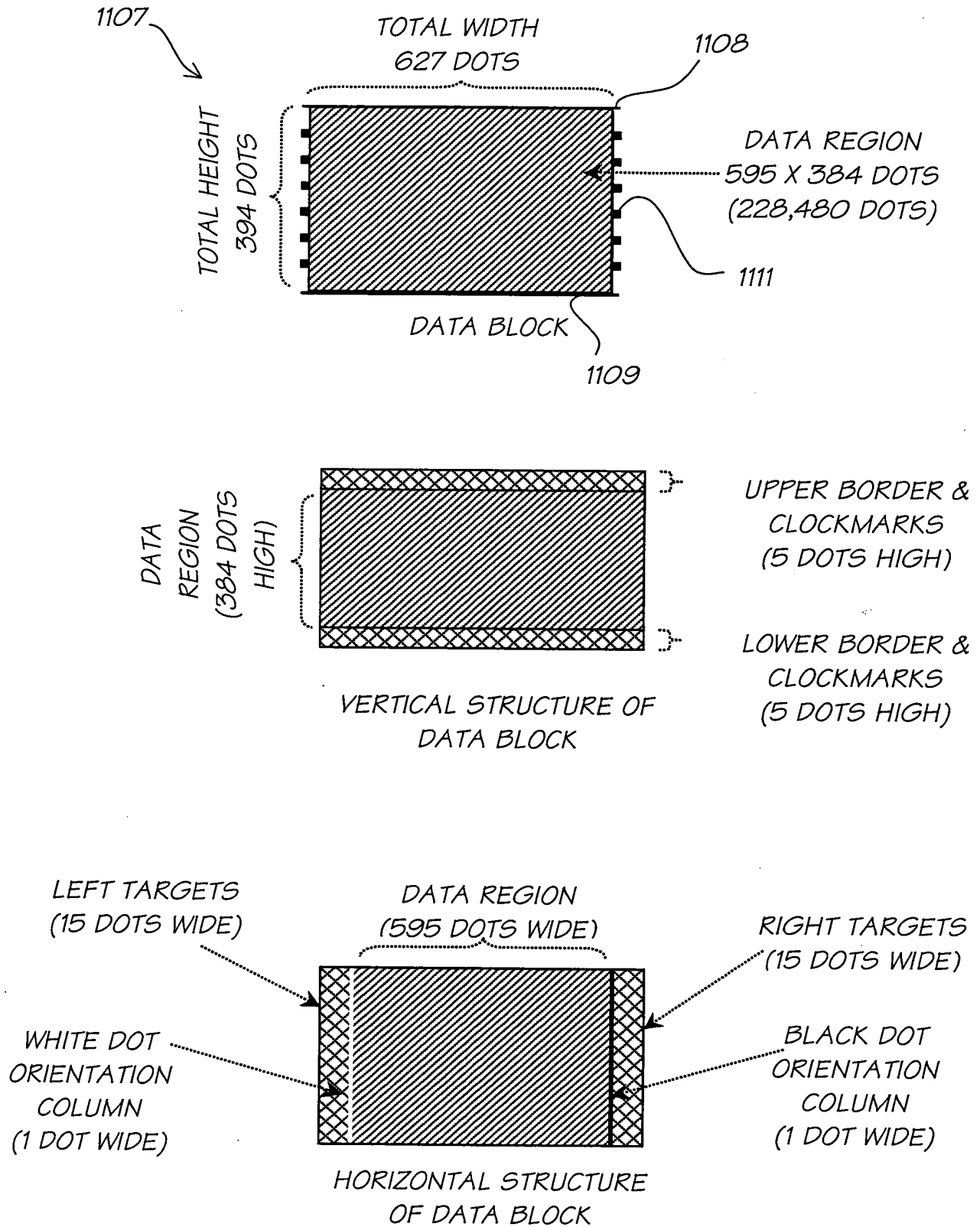


FIG. 49

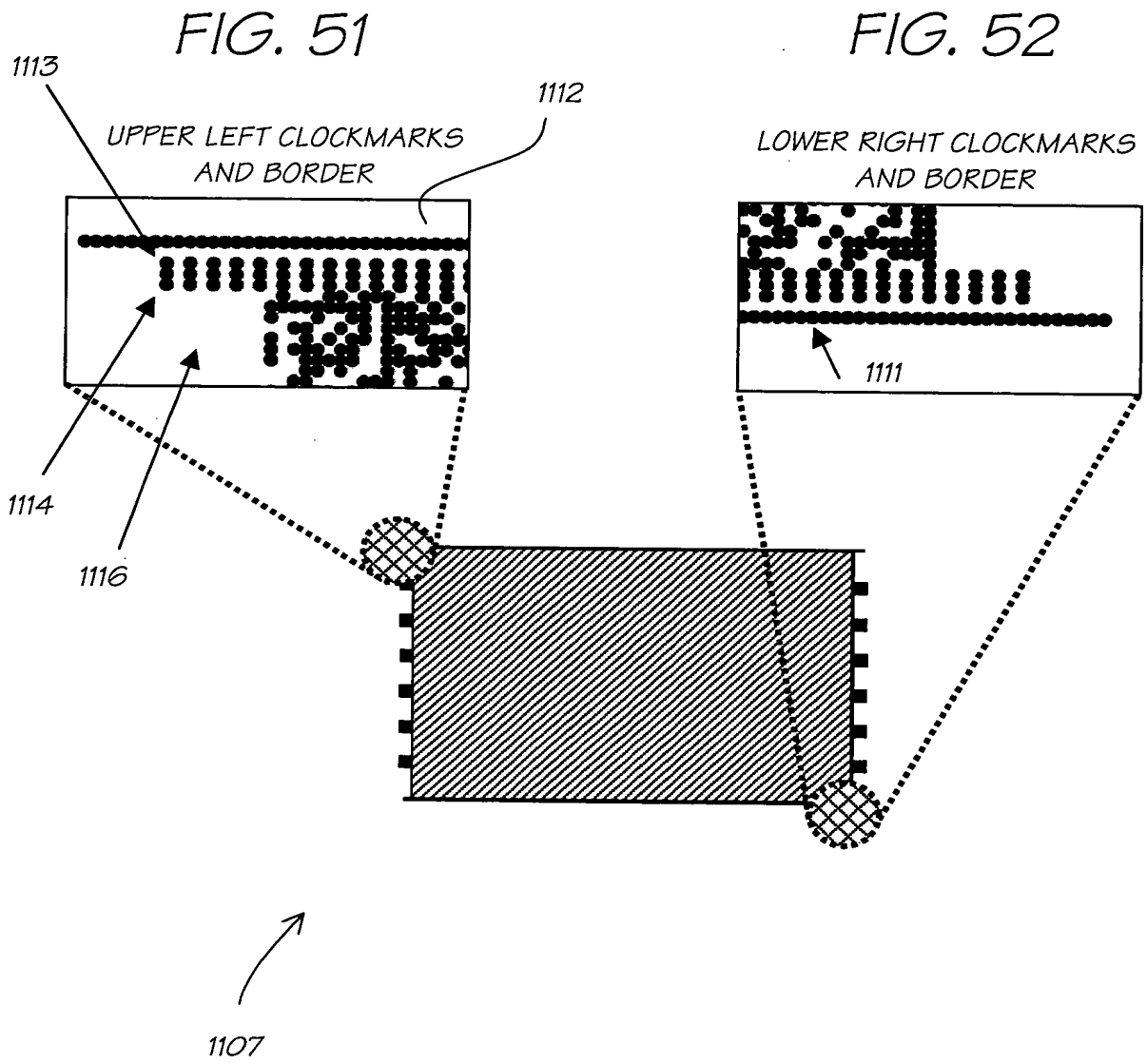


FIG. 50

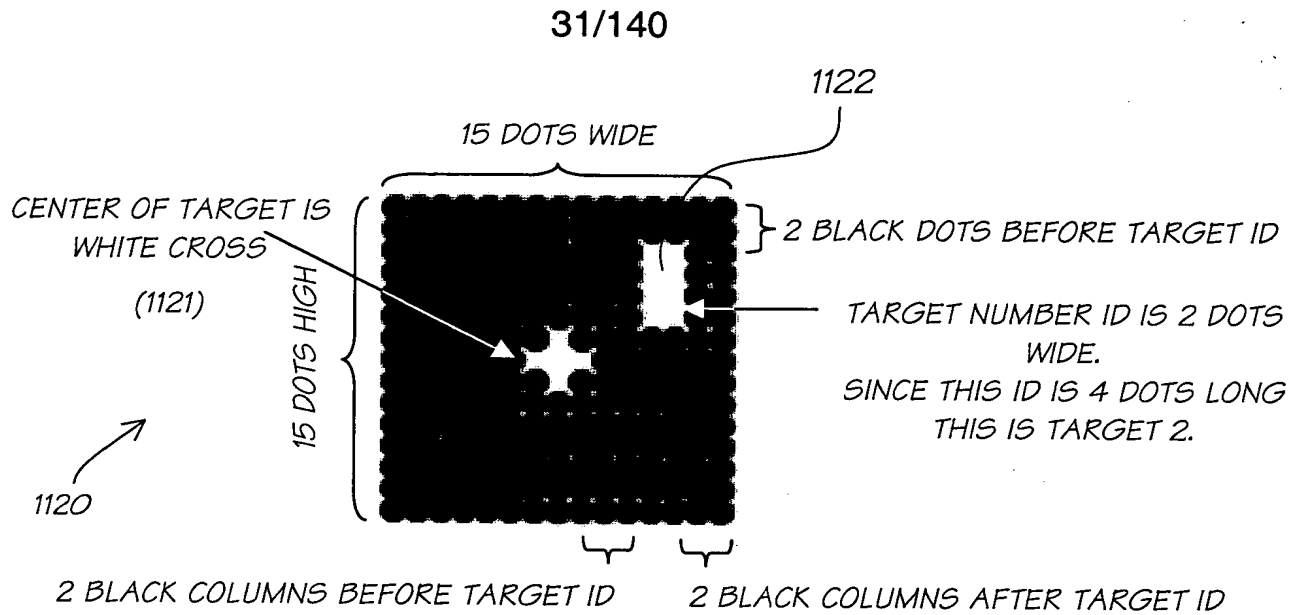


FIG. 53

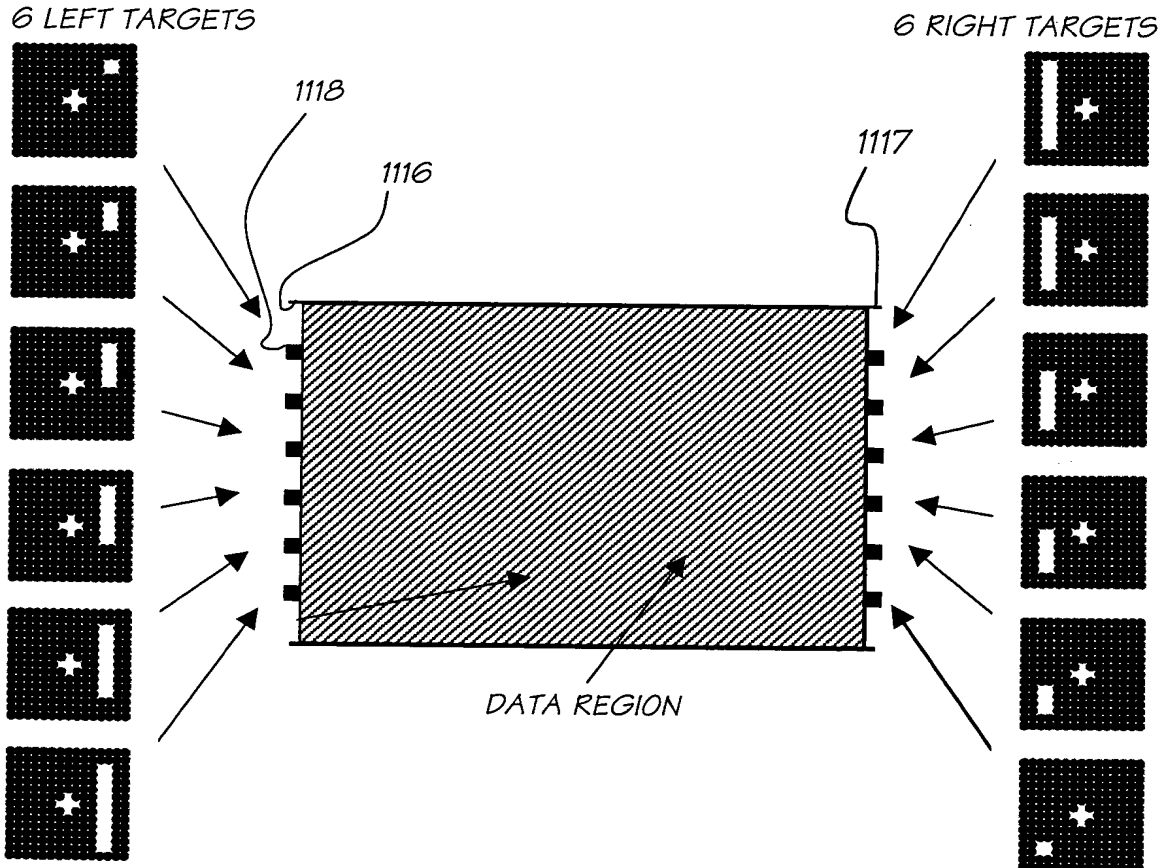


FIG. 54

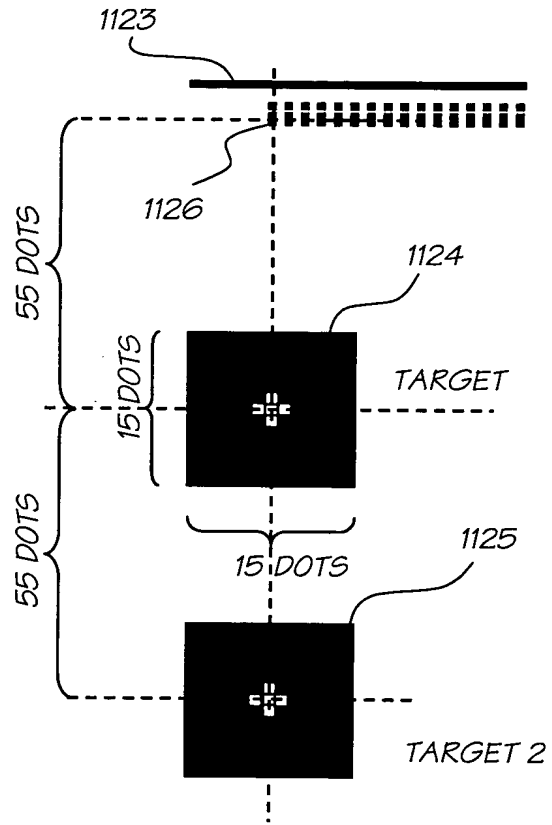


FIG. 55

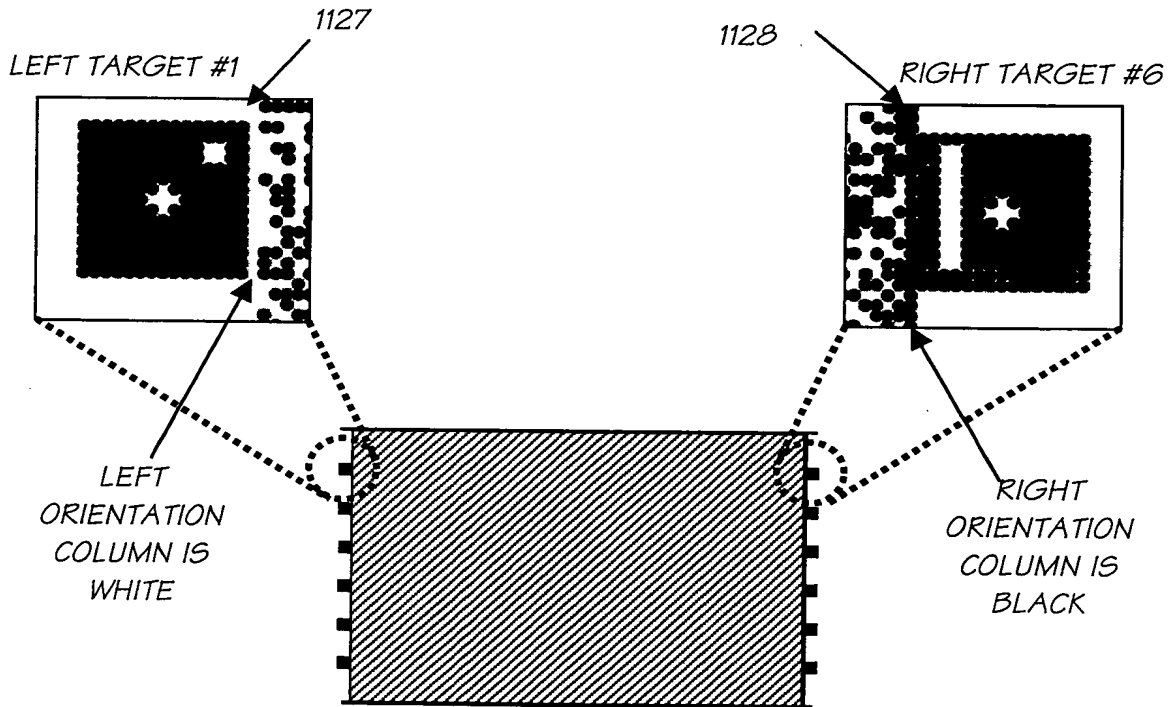


FIG. 56

33/140

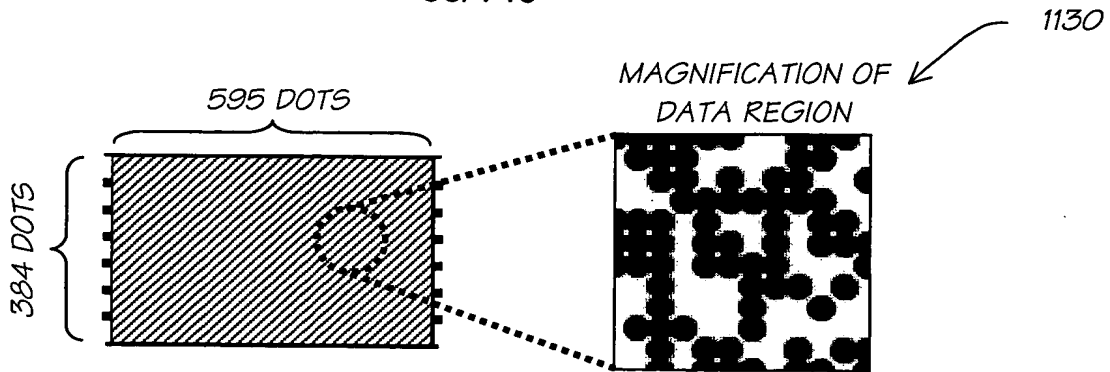


FIG. 57

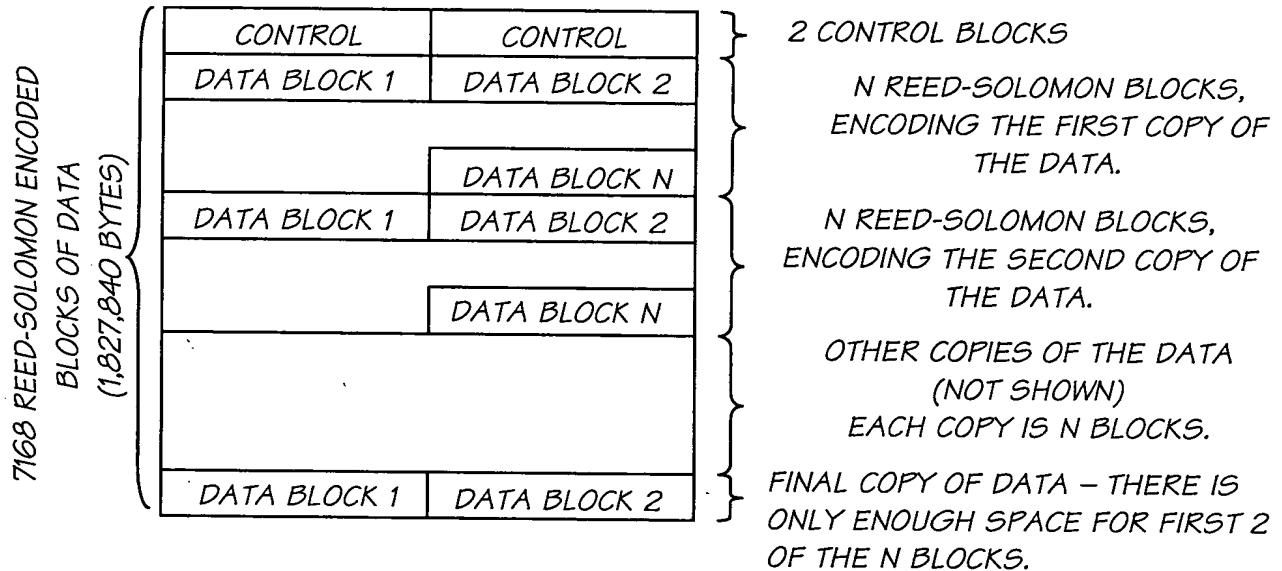


FIG. 58

00:	4F	00	3D	4F	00	3D	4F	00	3D	4F	00	3D
0C:	4F	00	3D	4F	00	3D	4F	00	3D	4F	00	3D
18:	4F	00	3D	4F	00	3D	4F	00	3D	4F	00	3D
24:	4F	00	3D	4F	00	3D	4F	00	3D	4F	00	3D
30:	4F	00	3D	4F	00	3D	4F	00	3D	4F	00	3D
3C:	4F	00	3D	4F	00	3D	4F	00	3D	4F	00	3D
48:	4F	00	3D	4F	00	3D	4F	00	3D	4F	00	3D
54:	4F	00	3D	4F	00	3D	4F	00	3D	4F	00	3D
60:	00	00	00	00	00	00	00	00	00	00	00	00
6C:	00	00	00	00	00	00	00	00	00	00	00	00
78:	00	00	00	00	00	00	00	00	00	00	00	00

32 COPIES OF THE 3 BYTE CONTROL INFORMATION

RESERVED BYTES ARE 0

FIG. 59

34/140

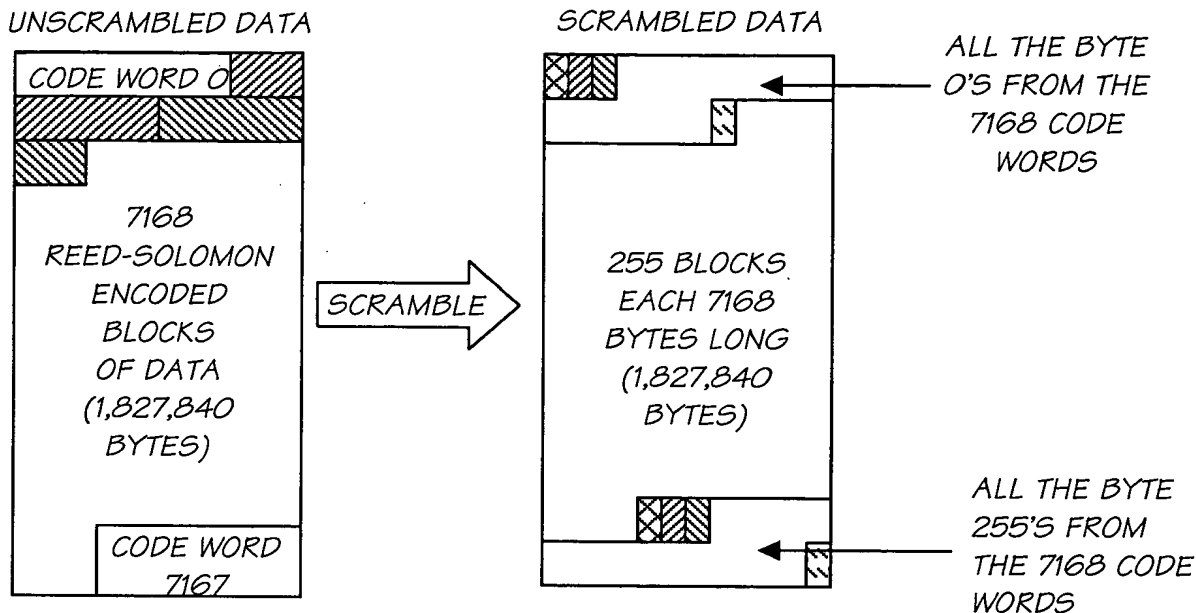


FIG. 60

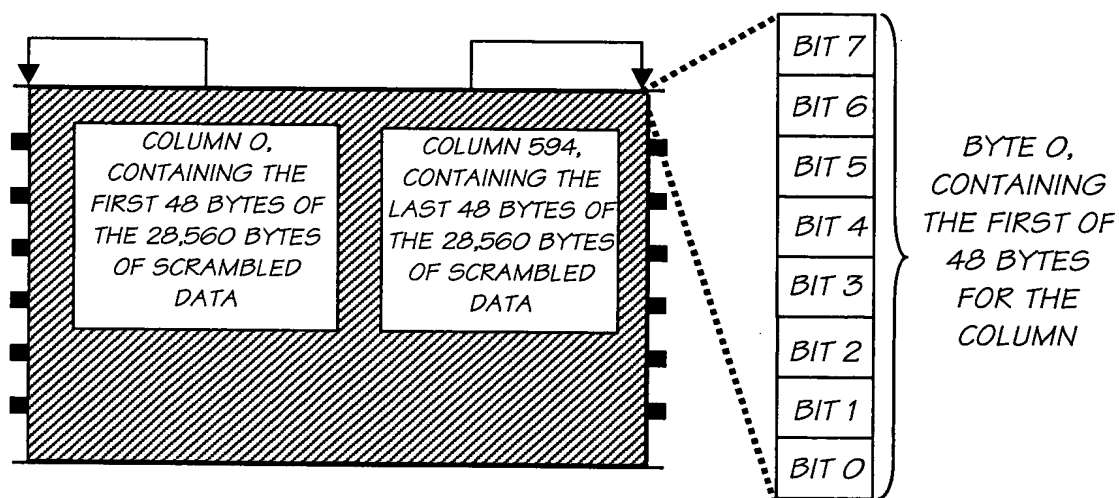


FIG. 61

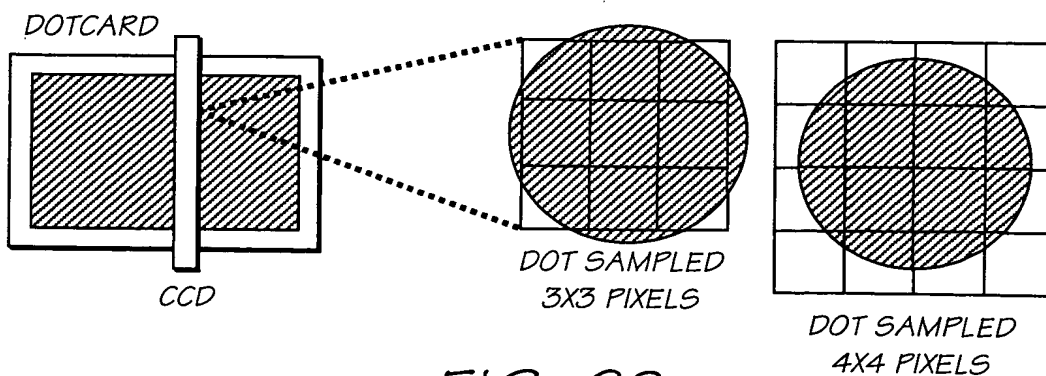


FIG. 62

36/140

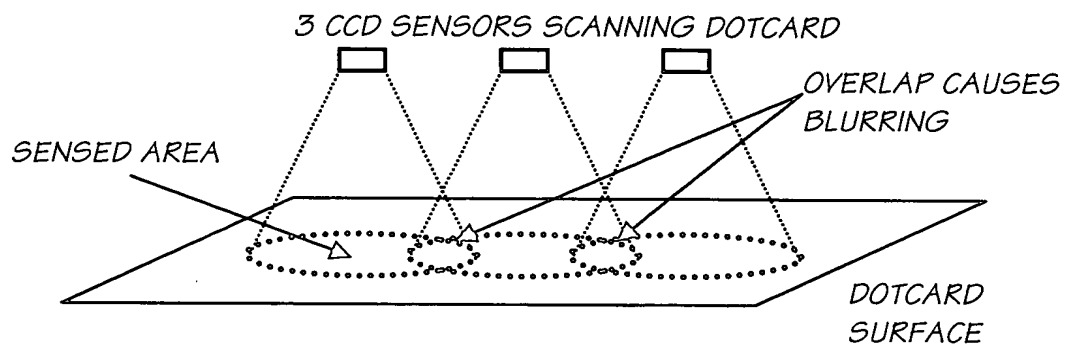


FIG. 64

RANGE OF BLACK DOTS
(FREQUENCY DISTRIBUTION)

RANGE OF WHITE DOTS
(FREQUENCY DISTRIBUTION)

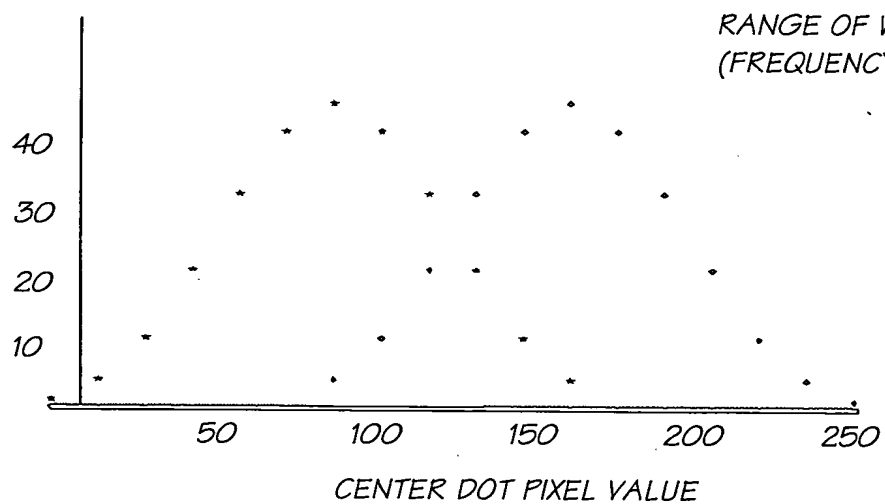


FIG. 65

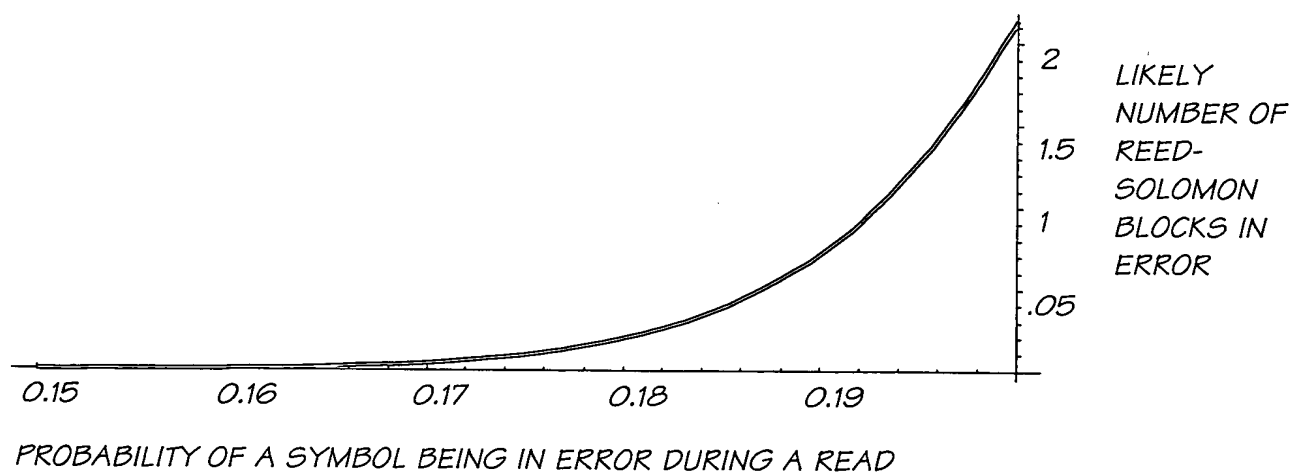
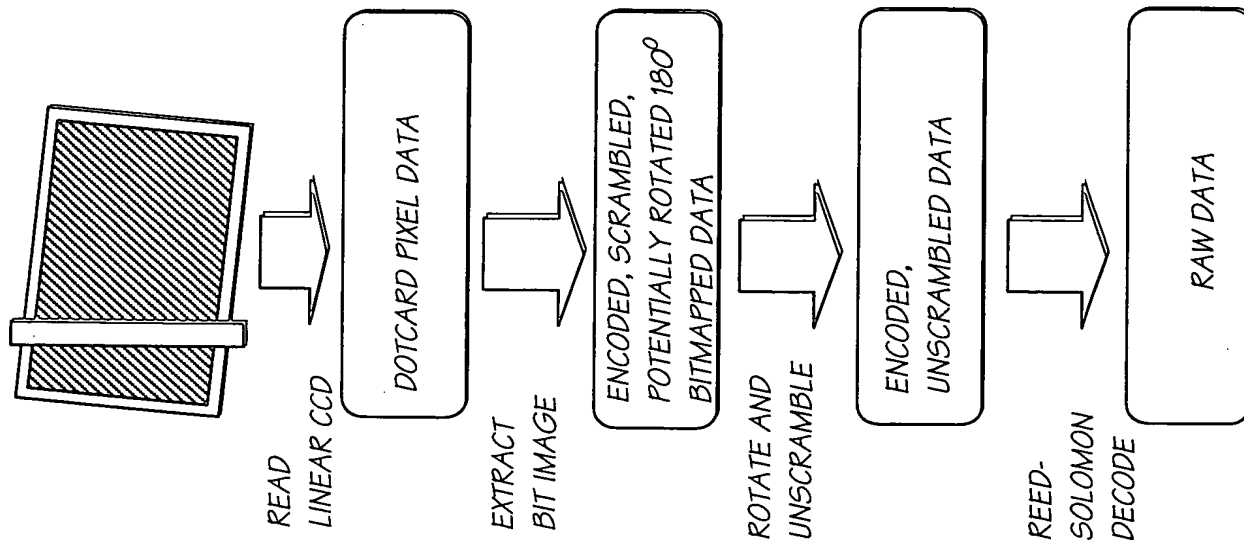


FIG. 66



APPROXIMATE DATA SIZES FOR 1600 DPI DOTCARD

86MM + 1MM IN HORIZONTAL DIMENSION FOR 1° ROTATION = 87MM

87MM = 16,252 SCANLINES

16,440 SCANLINES @ 11,000 PIXELS PER SCANLINE = 180,840,000 PIXELS

180,840,000 PIXELS @ 1 BYTE PER PIXEL = 180,840,000 BYTES = 172.5 MB

37/140

64 DATA BLOCKS, EACH CONTAINING 597 COLUMNS (595 DATA REGION COLUMNS AND 2 ORIENTATION COLUMNS), @ 48 BYTES PER COLUMN = 28,656 BYTES PER DATA BLOCK FOR A TOTAL OF 1,833,984 BYTES.

64 DATA BLOCKS, EACH CONTAINING 112 ENCODED REED SOLOMON BLOCKS, @ 255 BYTES PER REED SOLOMON BLOCK FOR A TOTAL OF 1,827,840 BYTES.

DECODED DATA, WITH A MAXIMUM SIZE OF 910,082 BYTES.
(64 X 112 X 127 - (2 CONTROL BLOCKS @ 127 BYTES))

FIG. 67

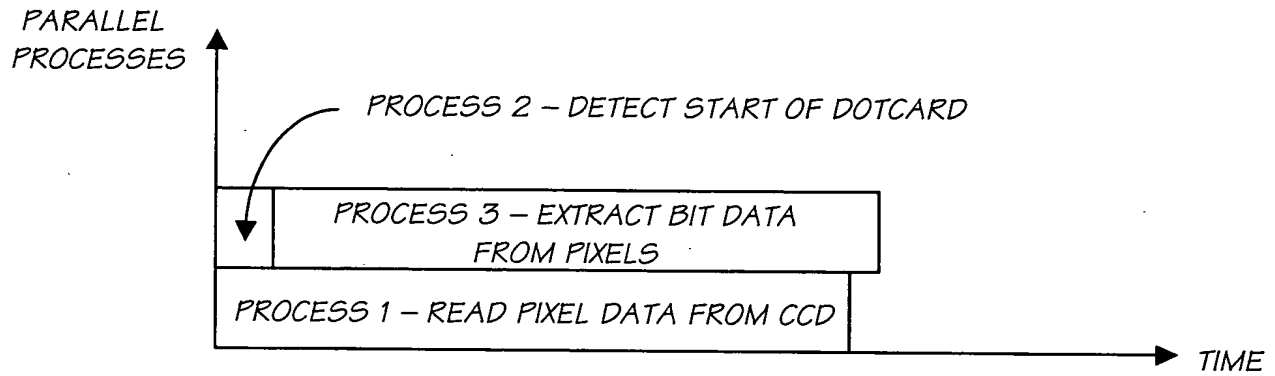


FIG. 68

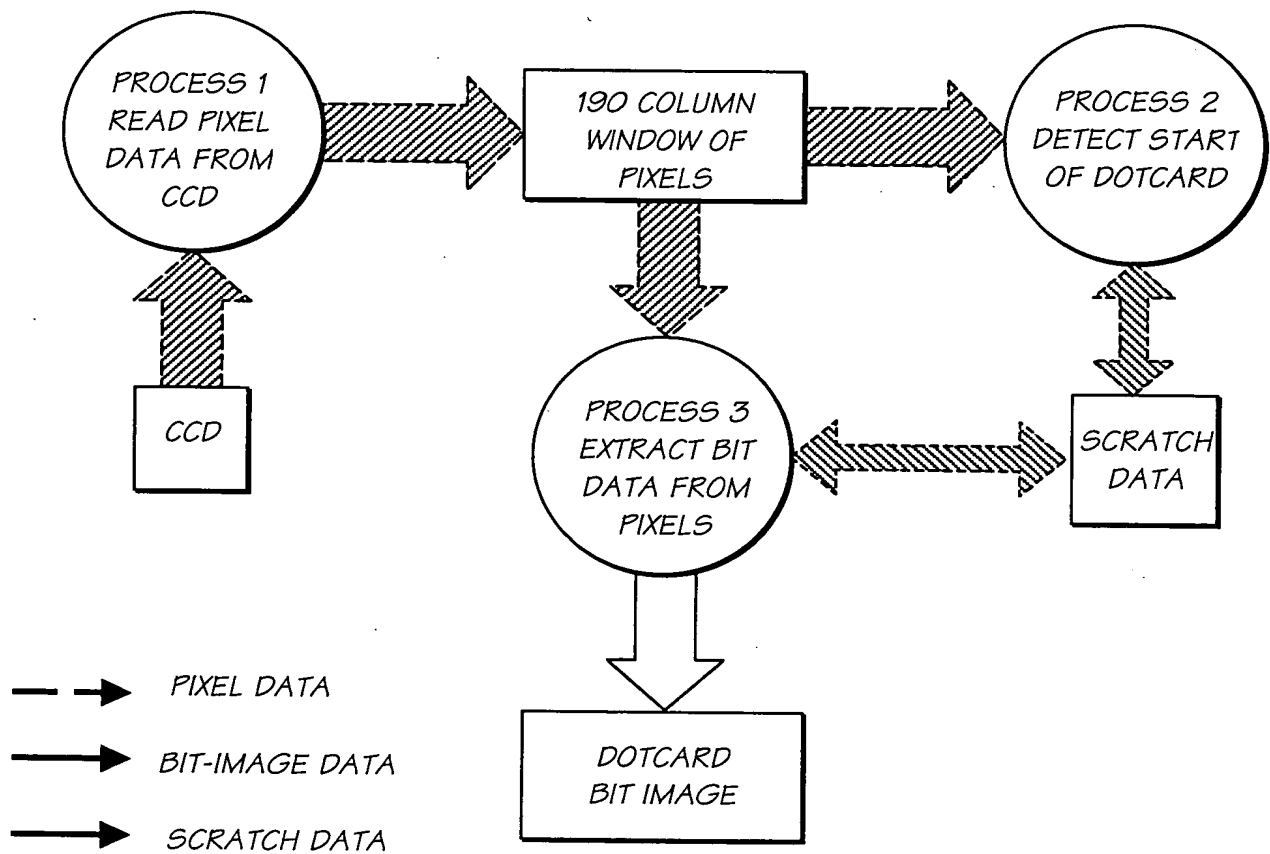


FIG. 69

39/140

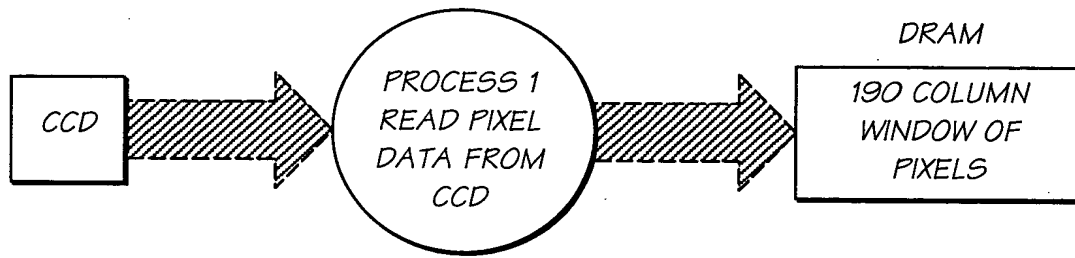


FIG. 70

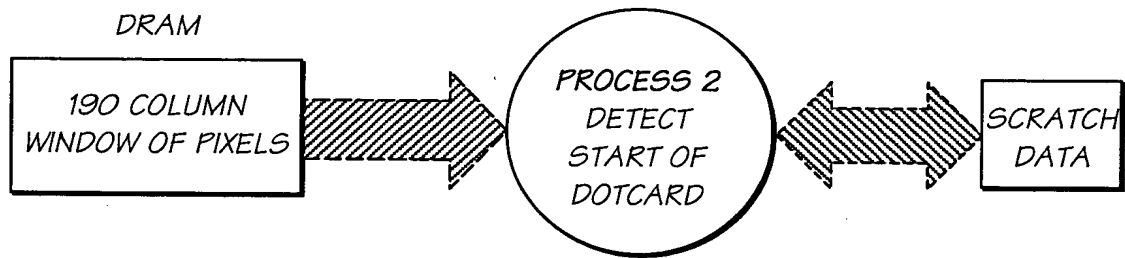


FIG. 71

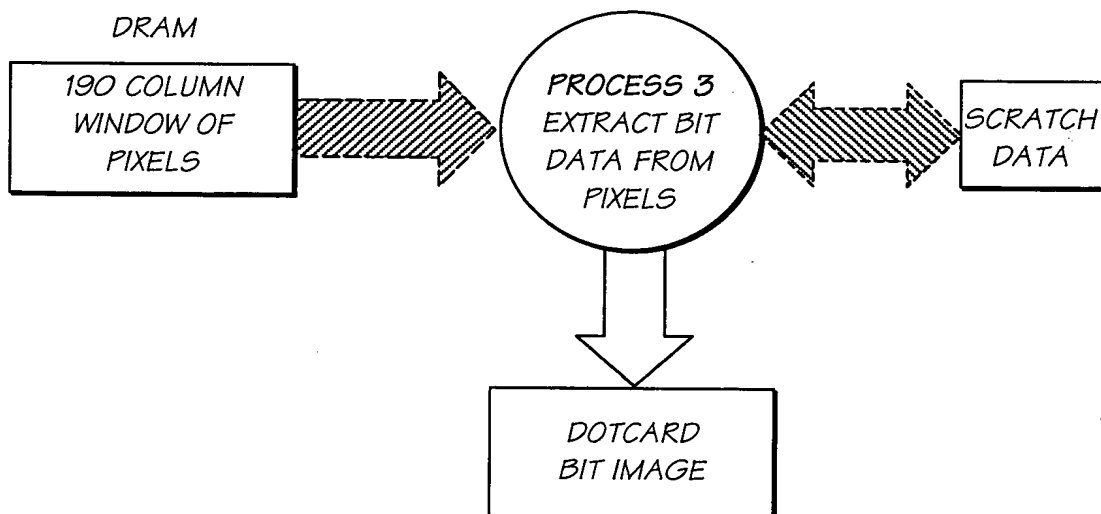


FIG. 72

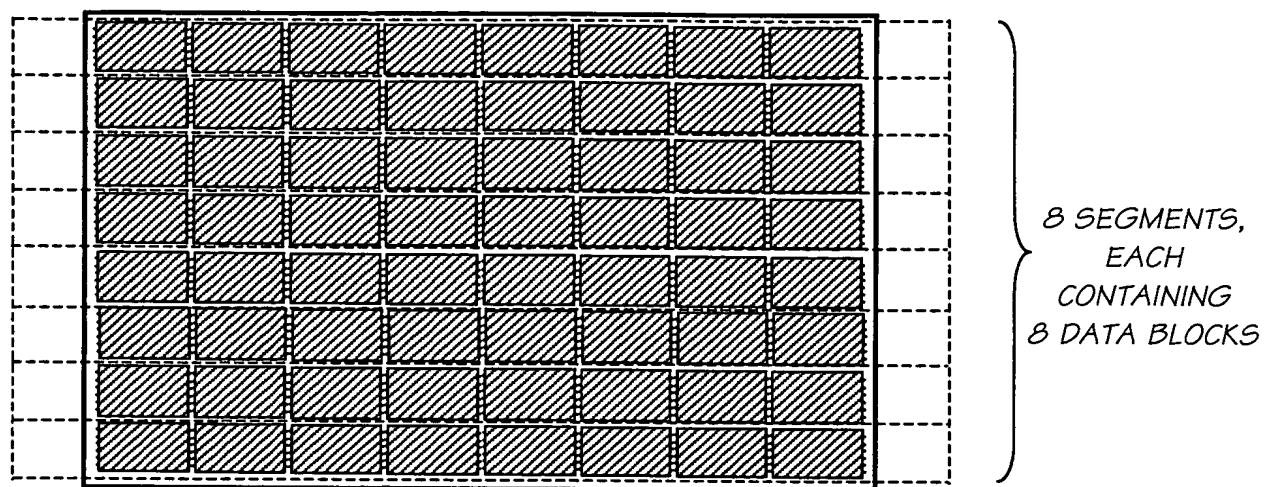


FIG. 73

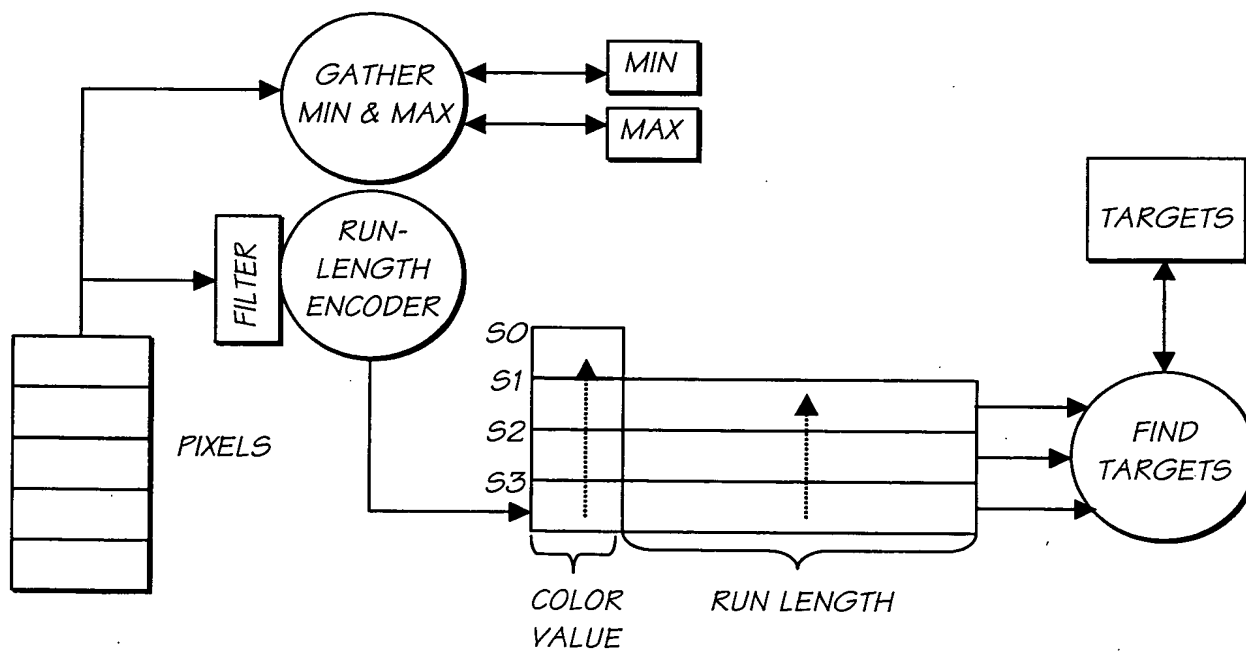


FIG. 74

41/140

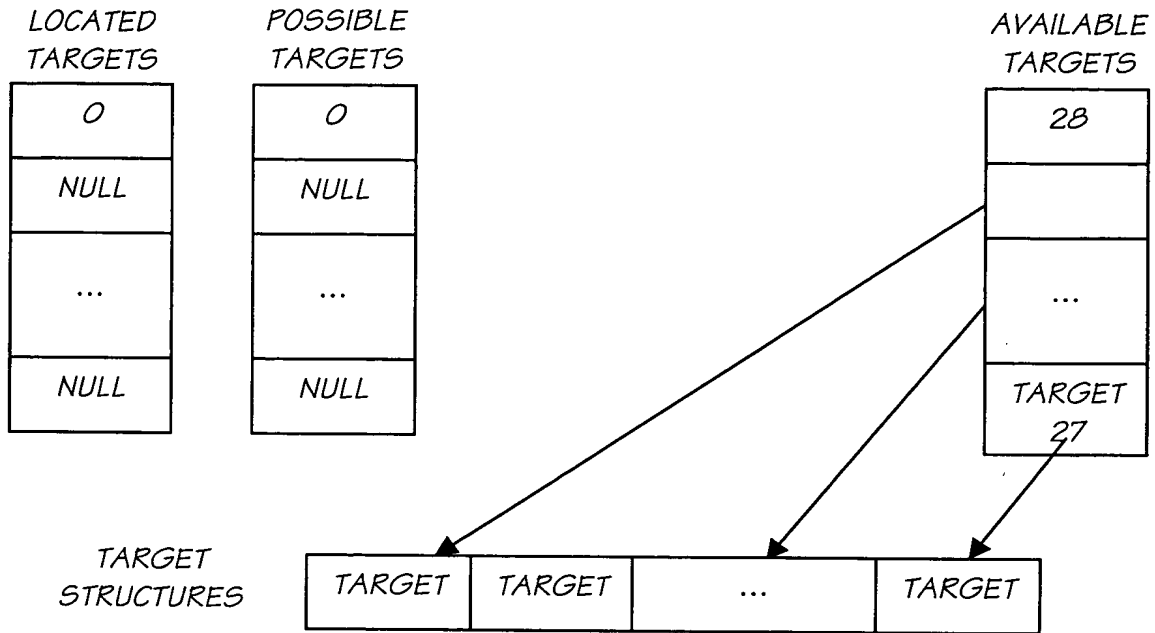


FIG. 75

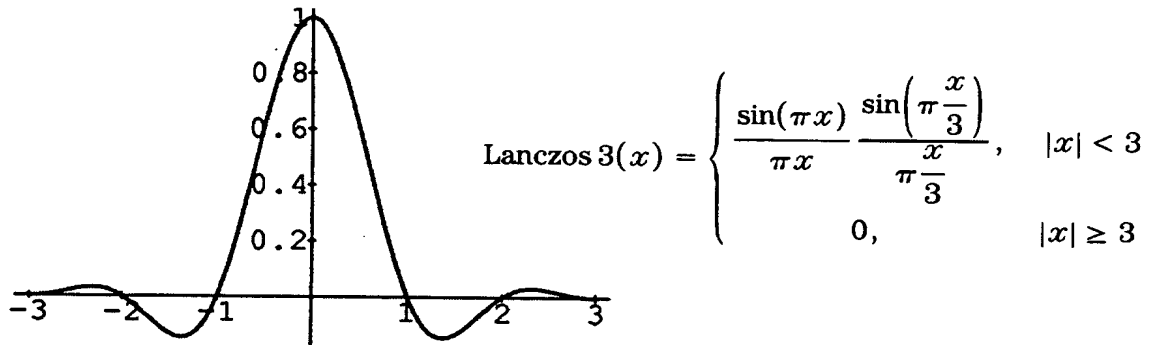


FIG. 76

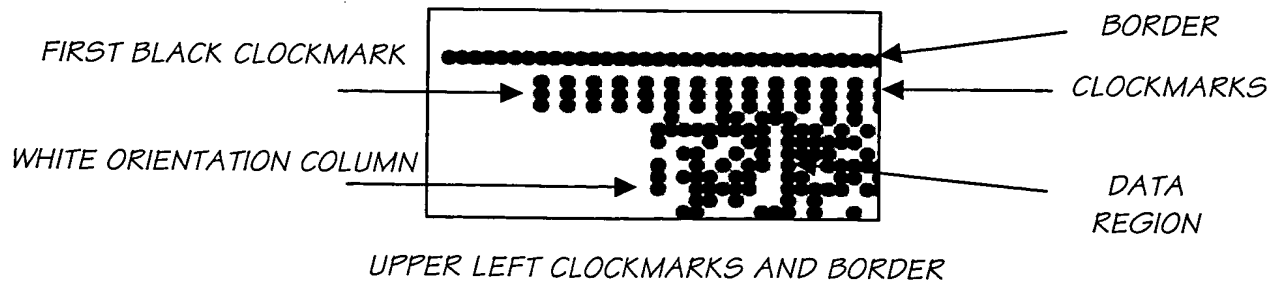


FIG. 77

42/140

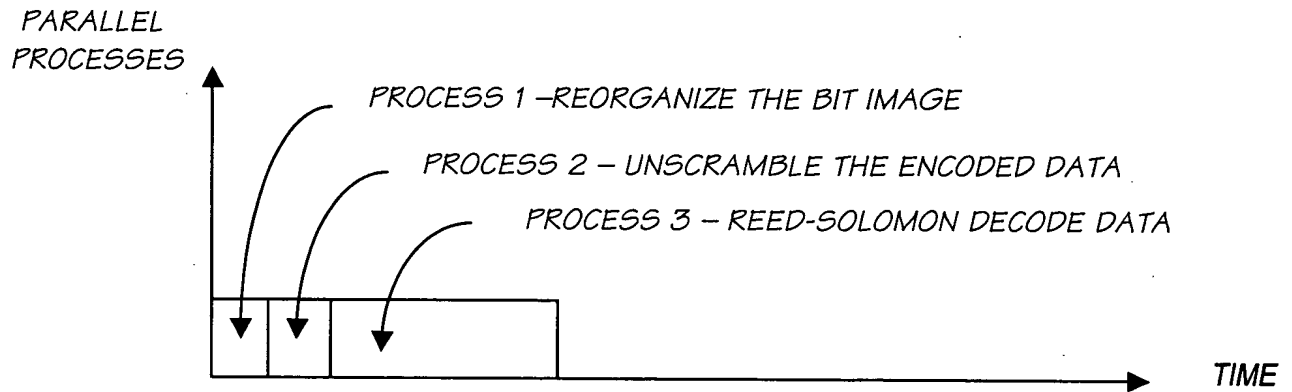


FIG. 78

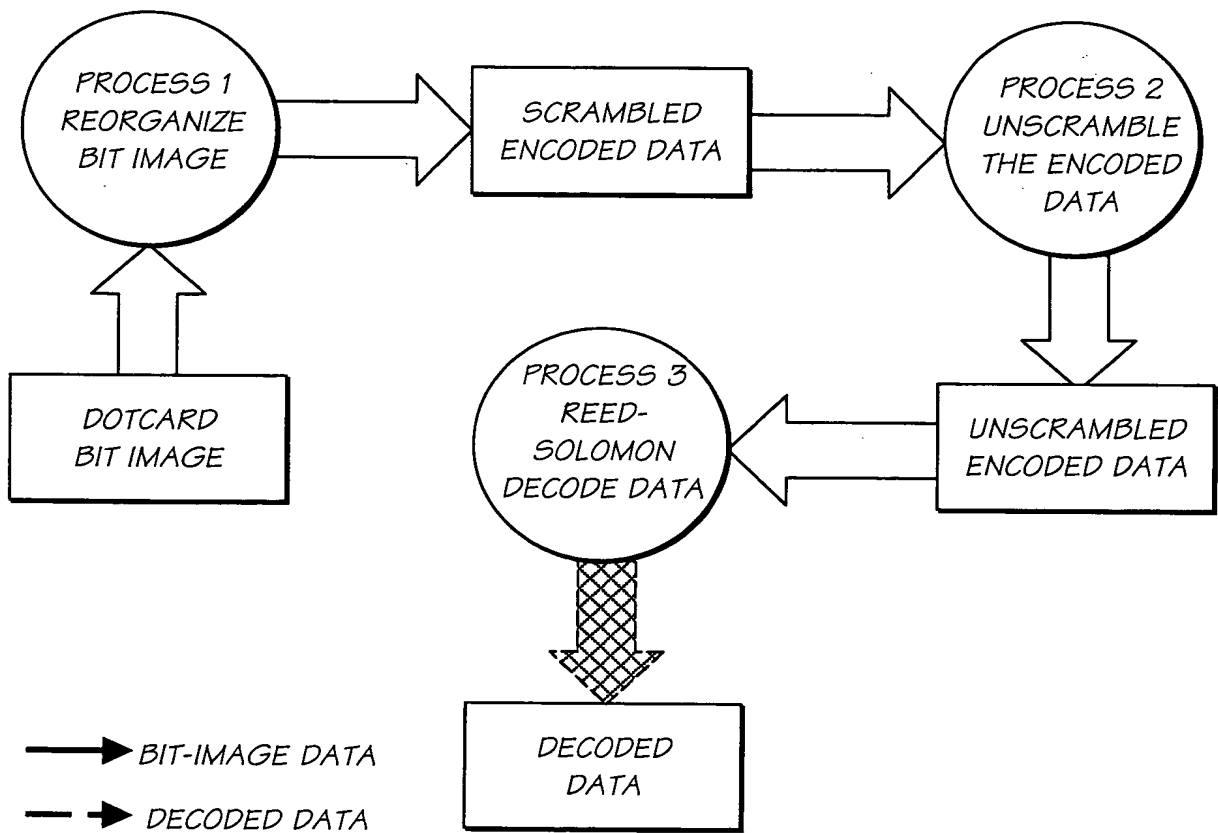


FIG. 79

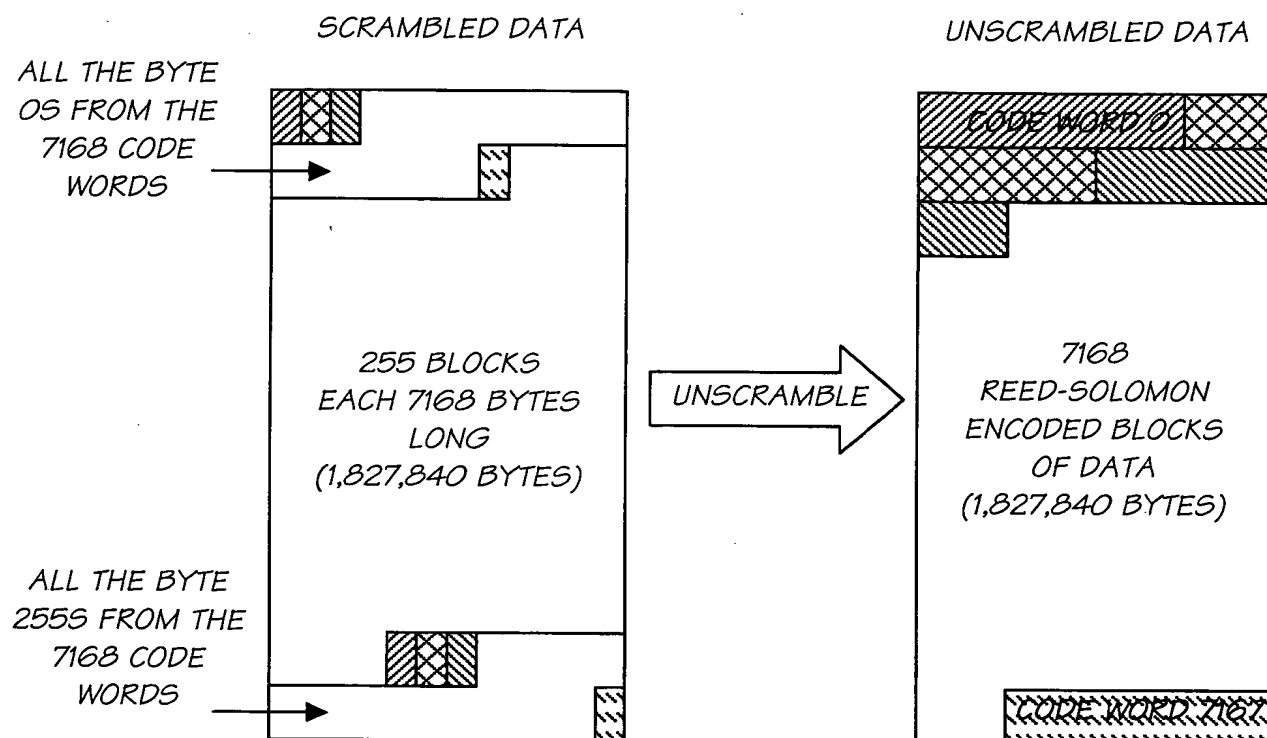


FIG. 80

44/140

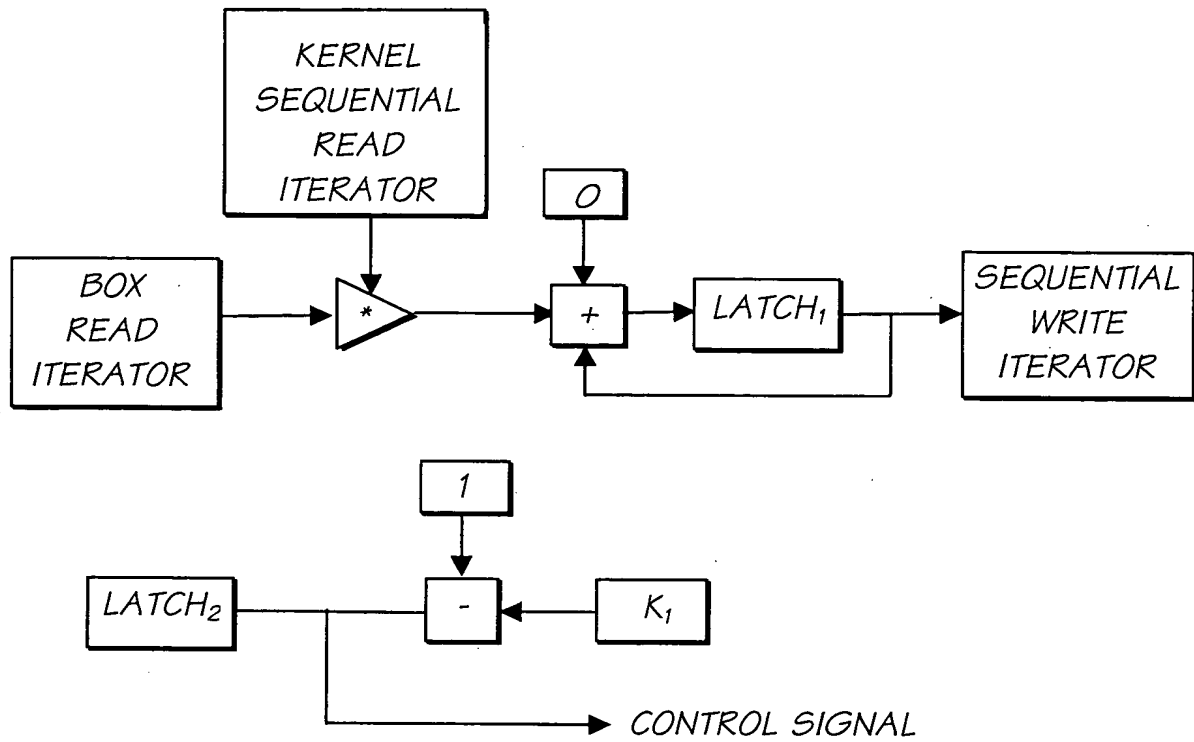


FIG. 81

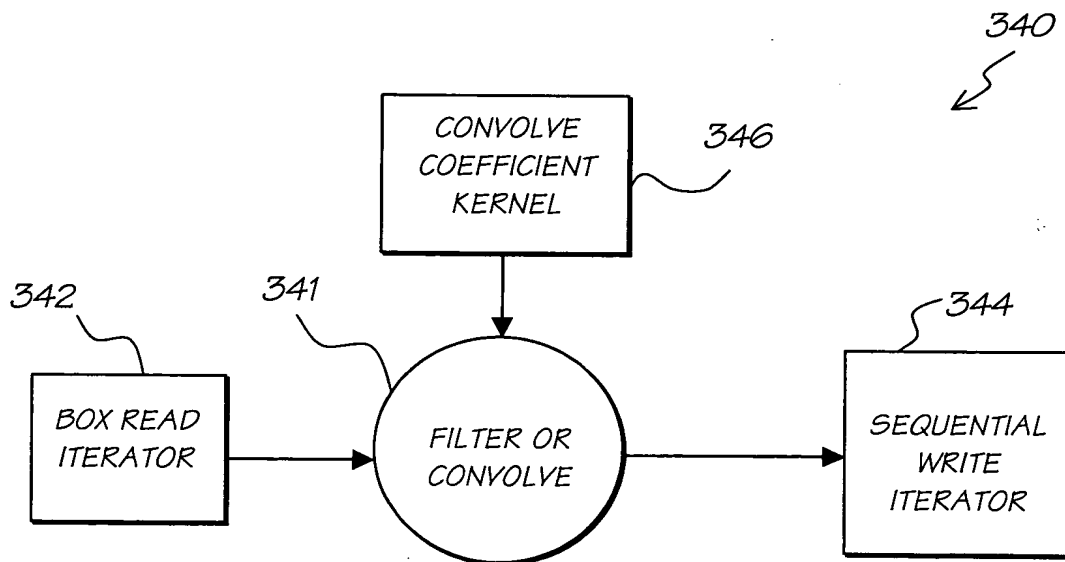


FIG. 82

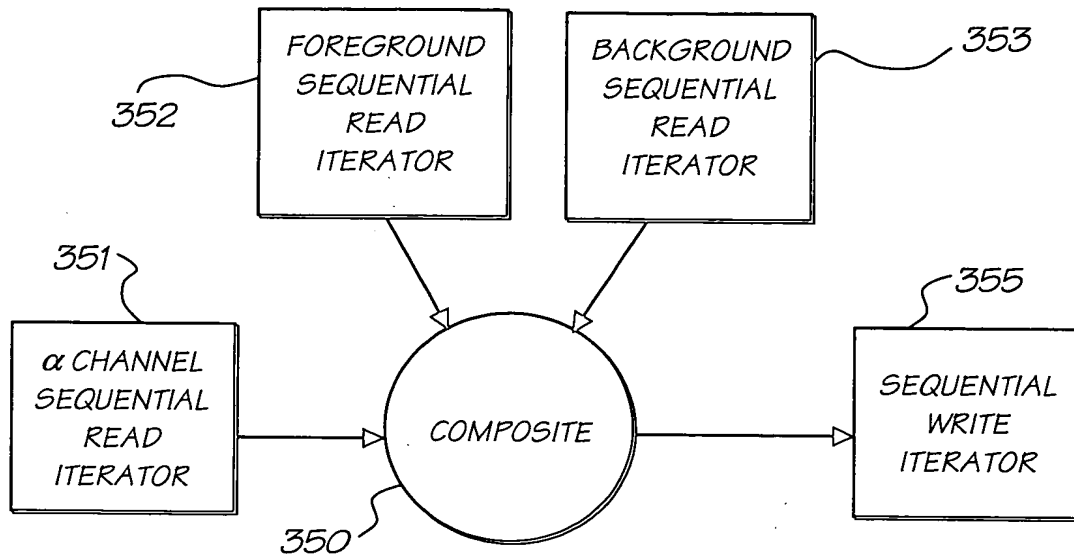


FIG. 83

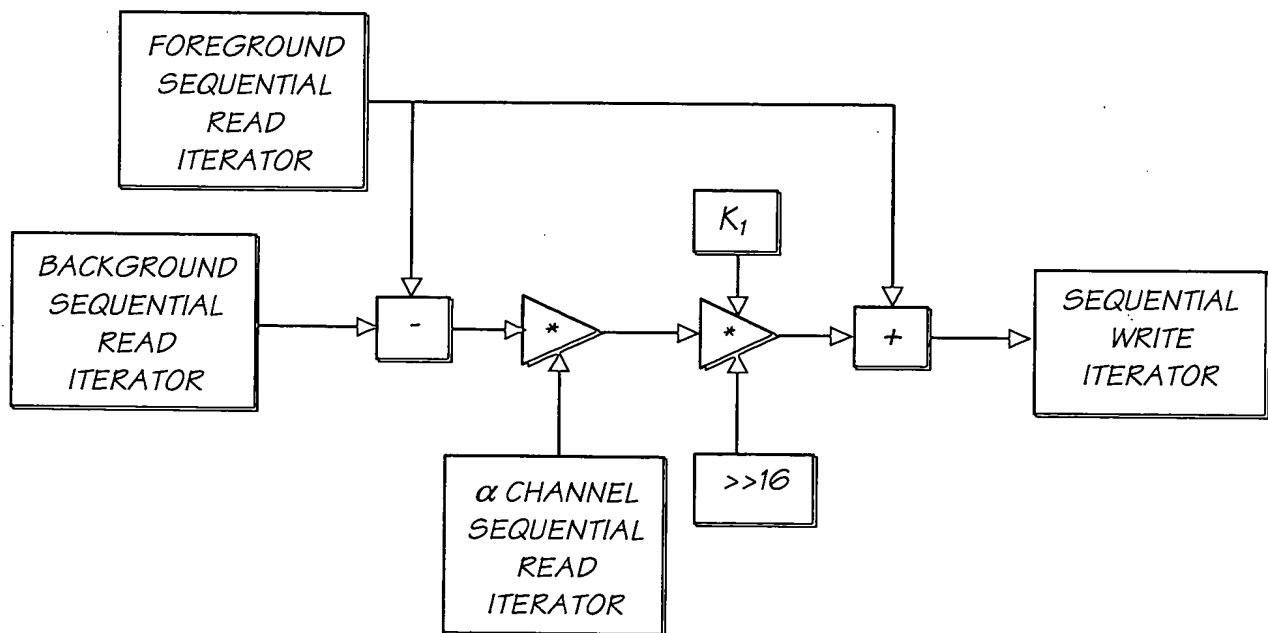


FIG. 84

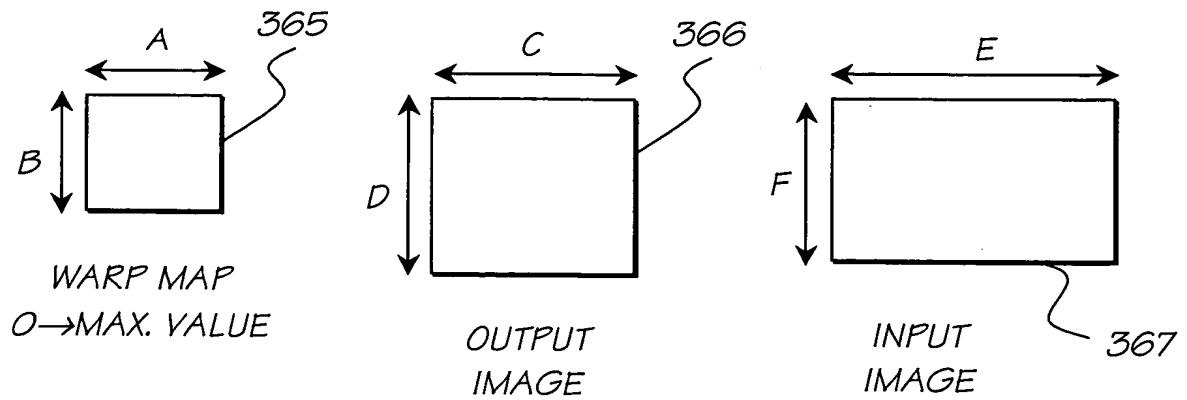


FIG. 85

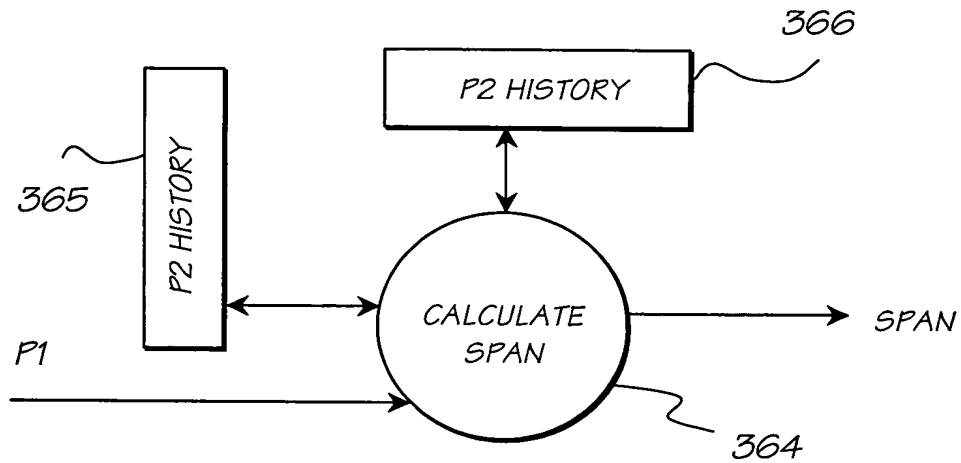


FIG. 86

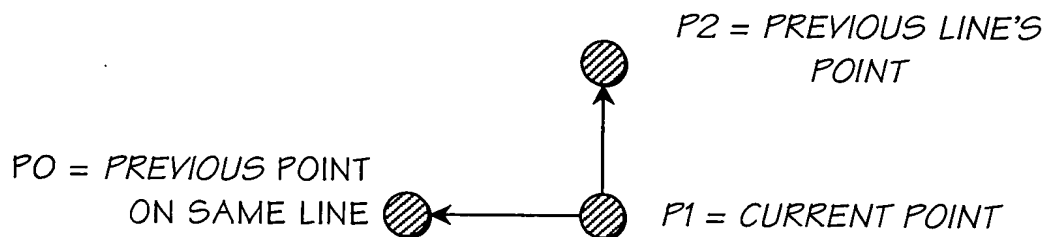


FIG. 88

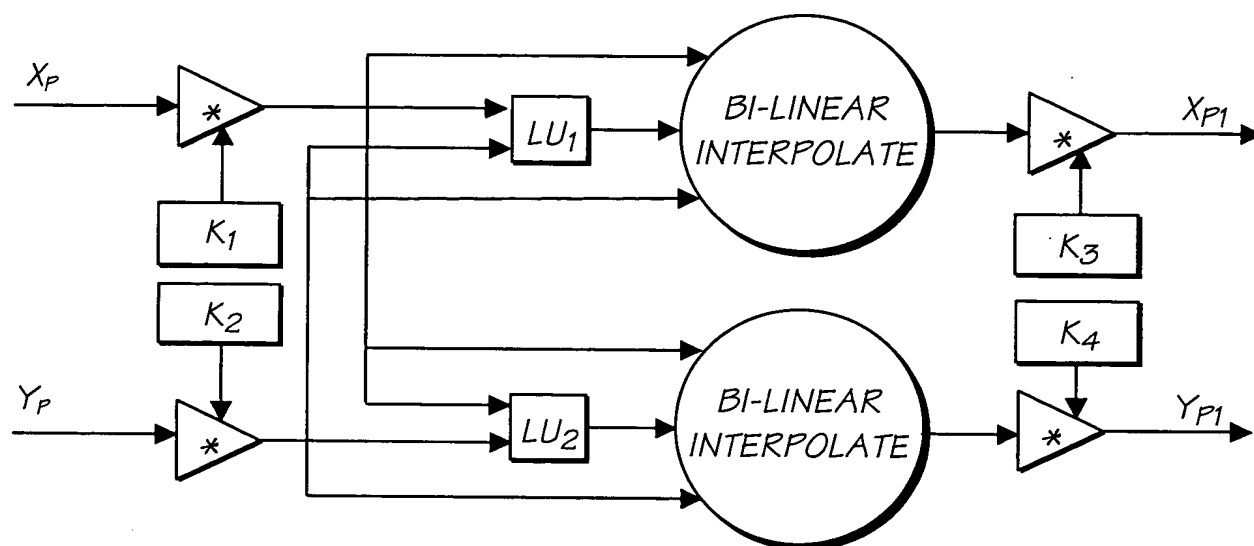


FIG. 87

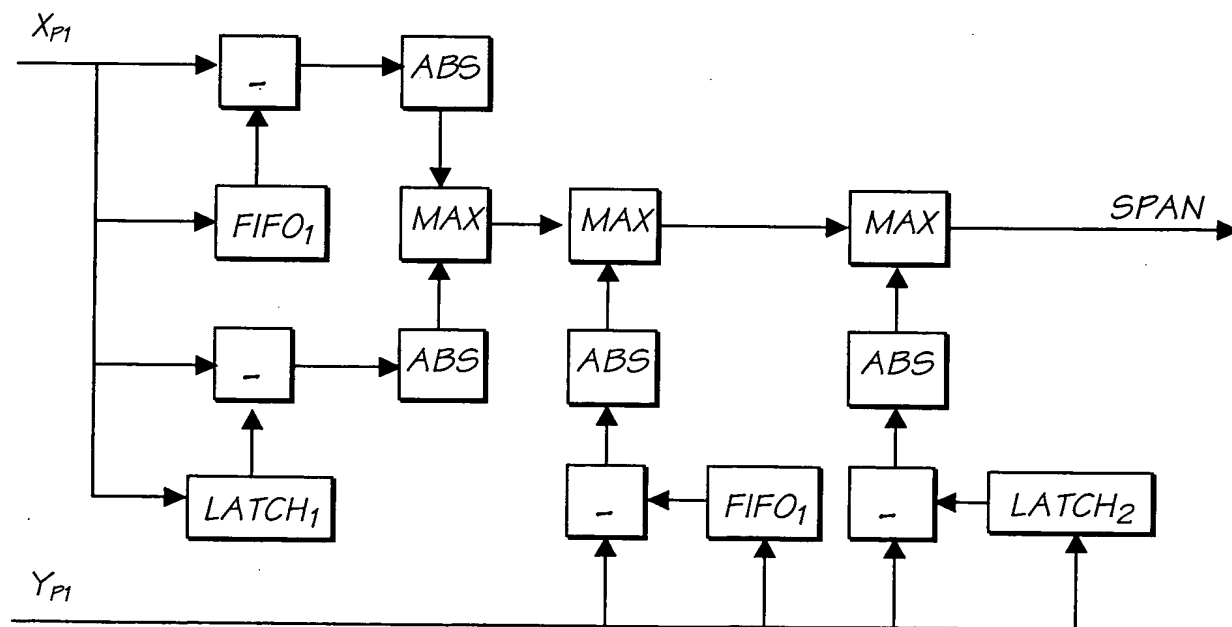


FIG. 89

48/140

POINT (x, y) ON LEVEL B
OF PYRAMID

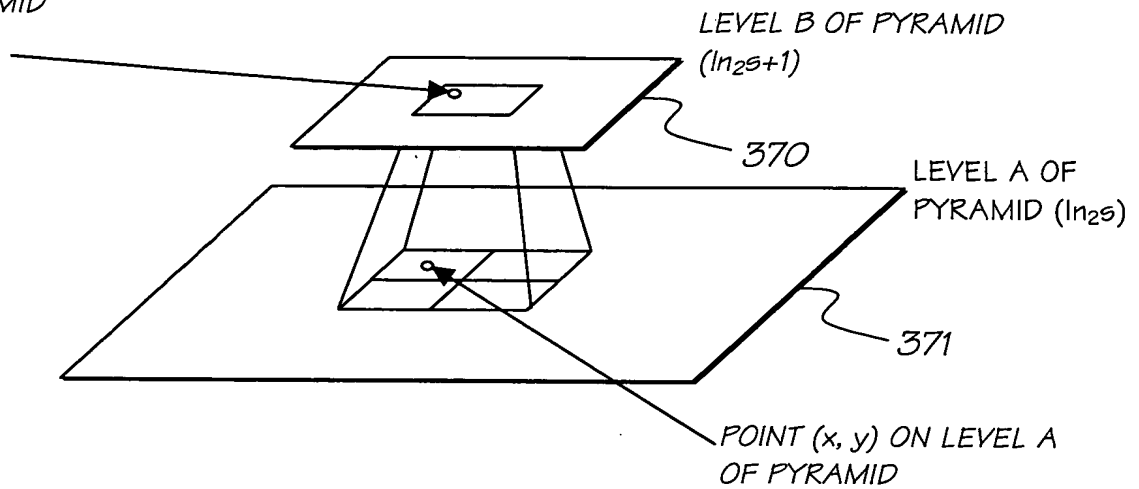


FIG. 90

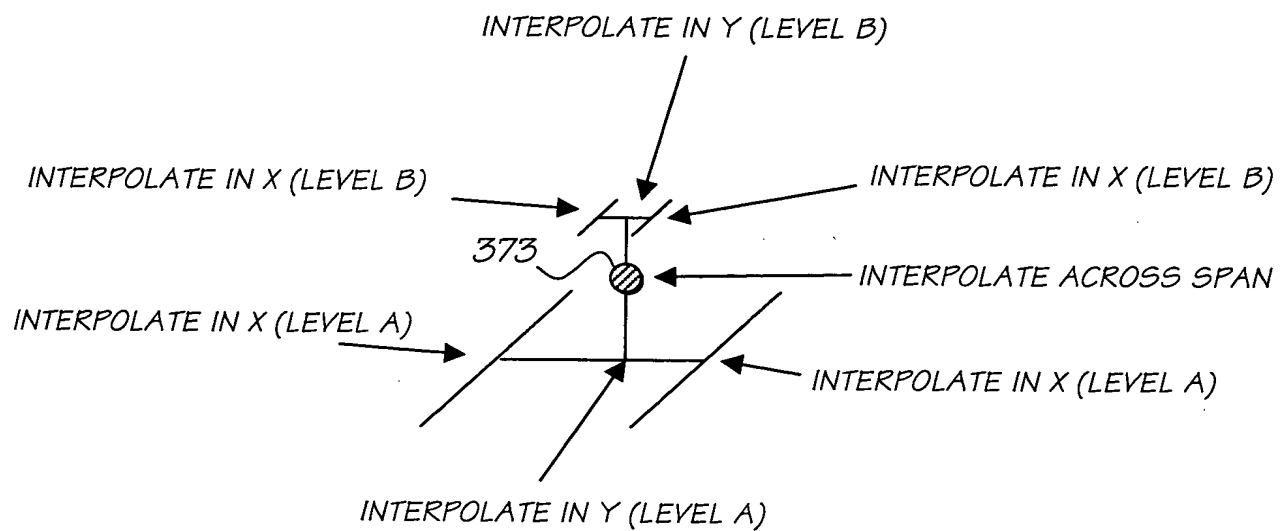


FIG. 91

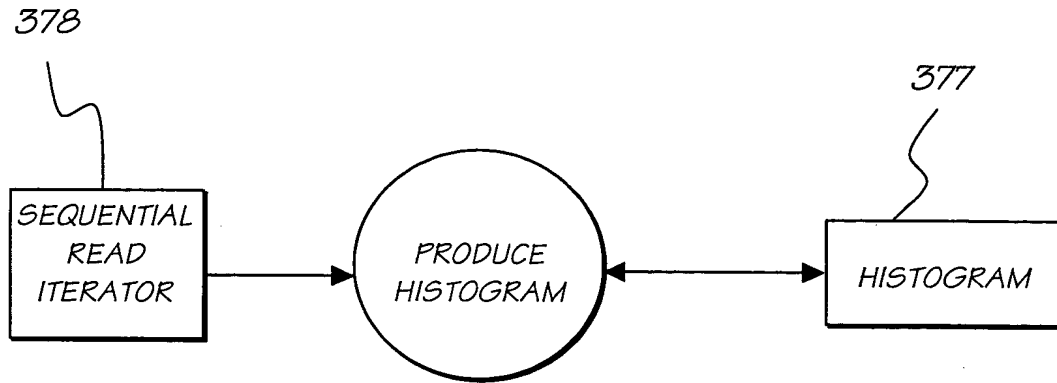


FIG. 92

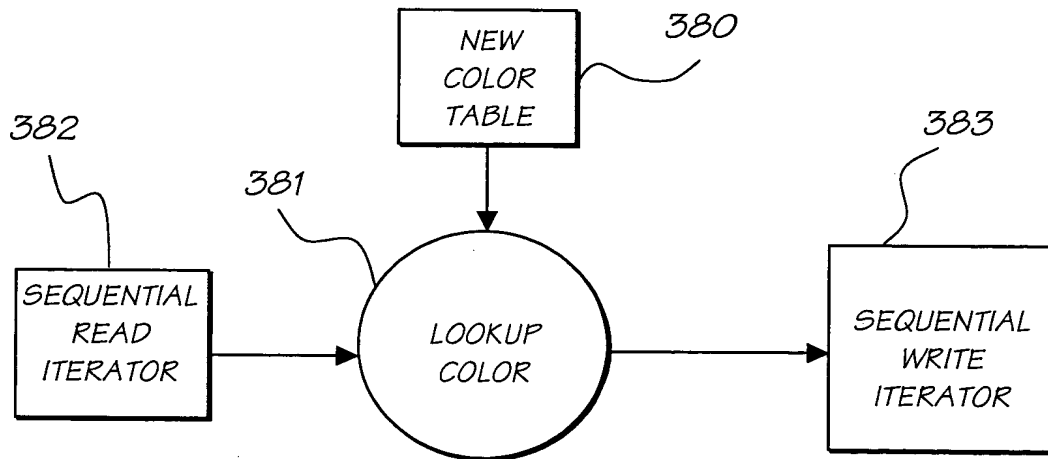


FIG. 93

50/140

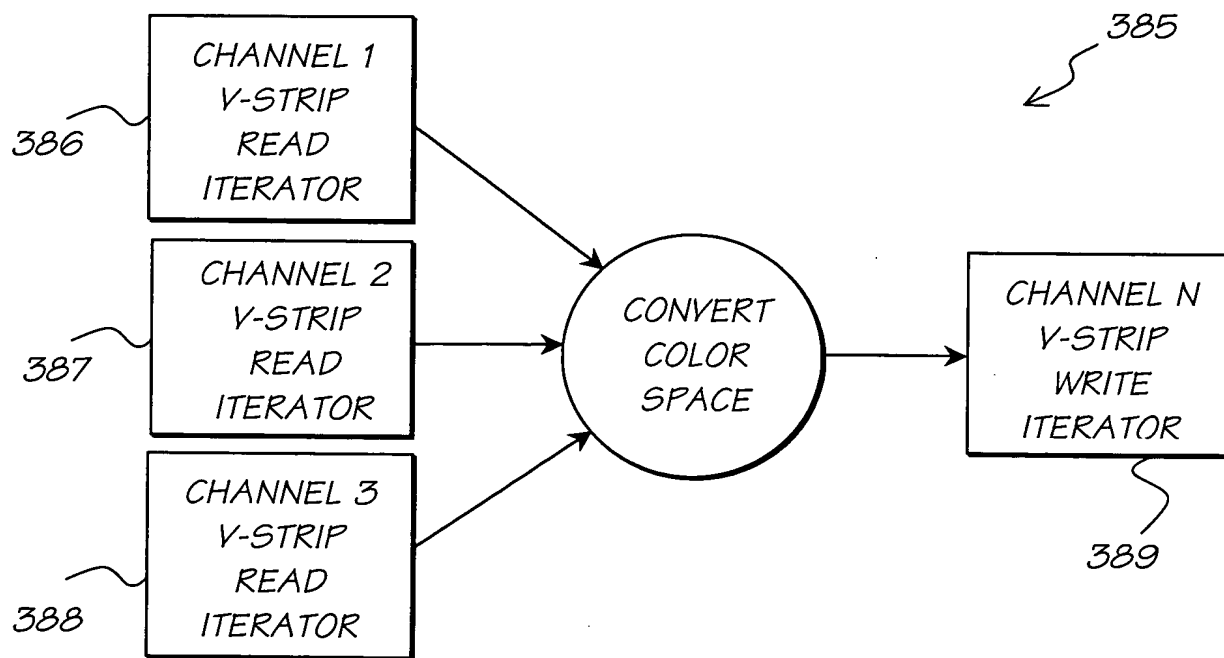


FIG. 94

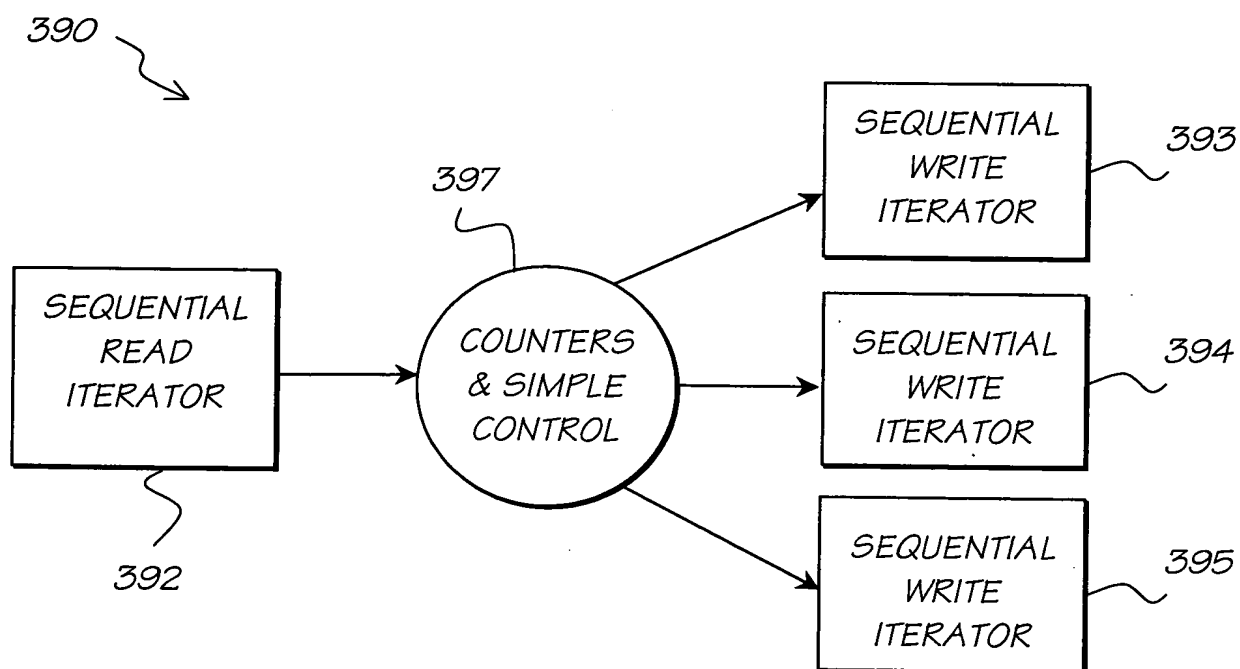


FIG. 101

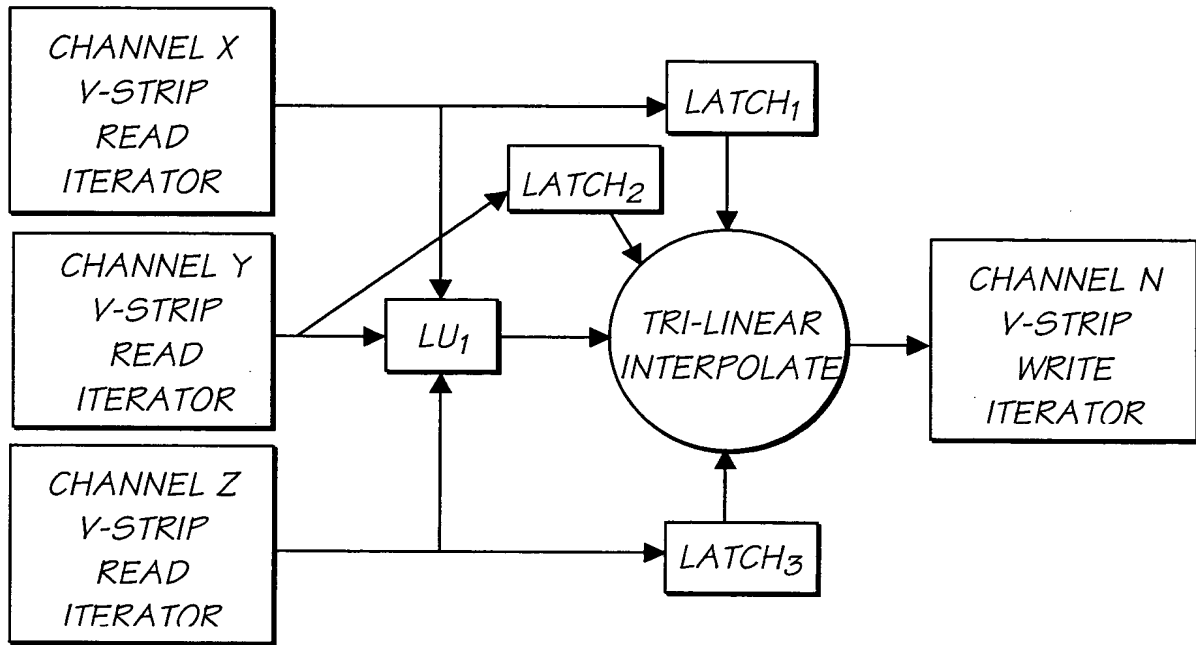


FIG. 95

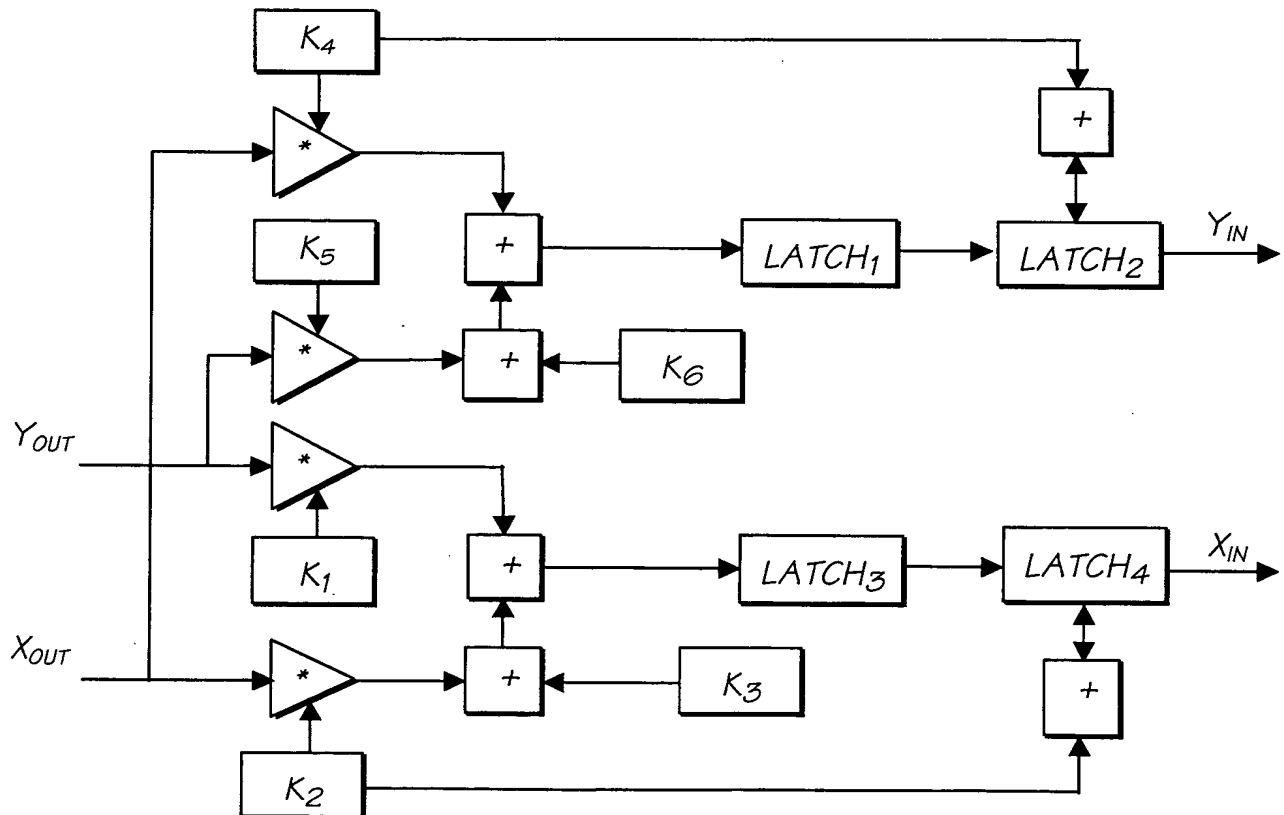


FIG. 96

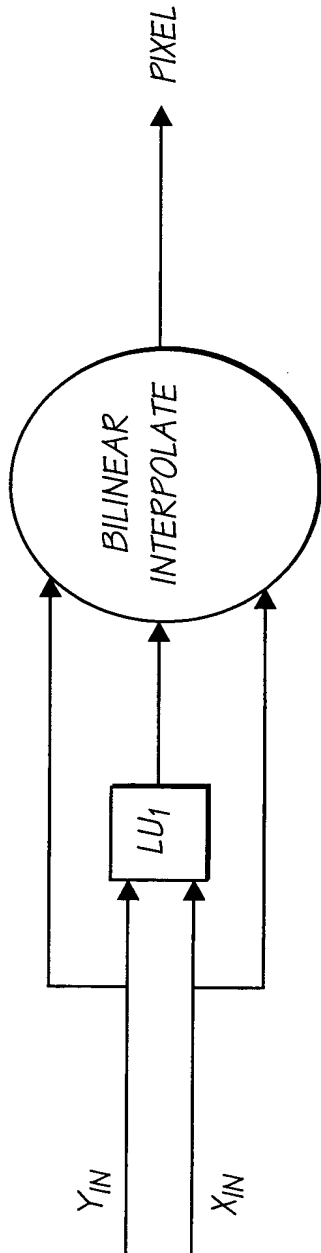


FIG. 97

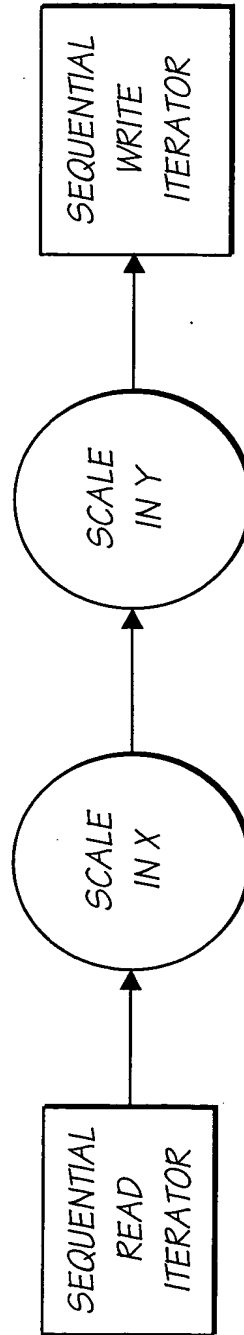


FIG. 98

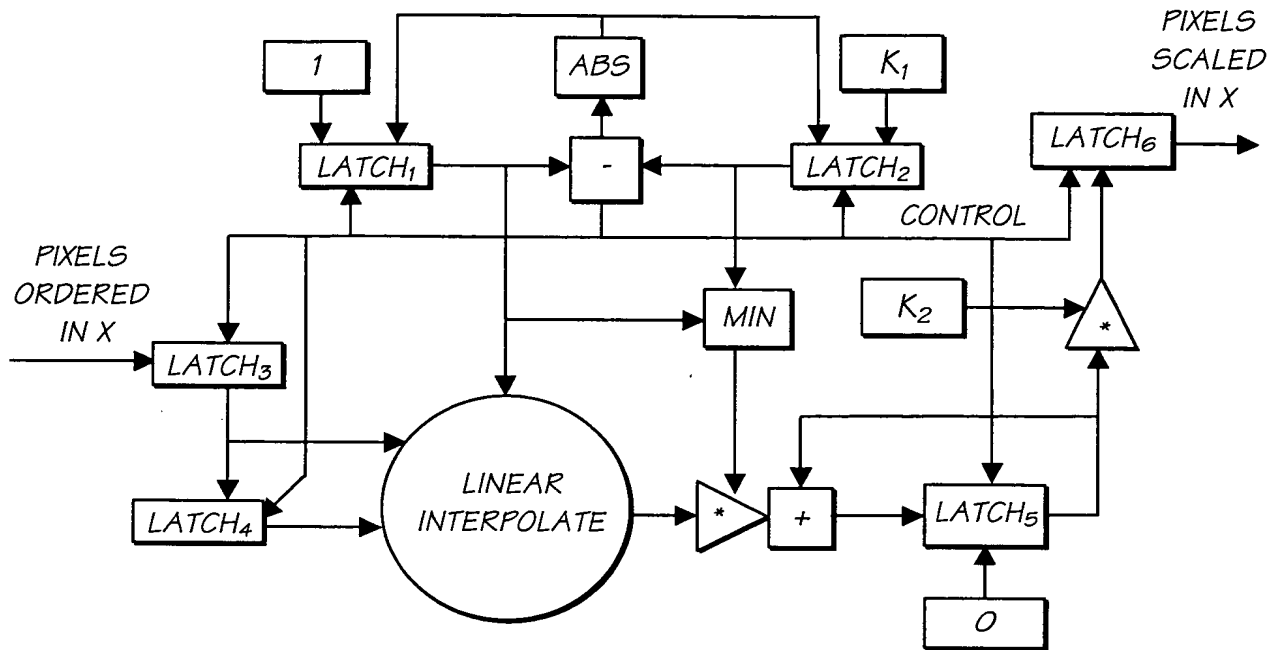


FIG. 99

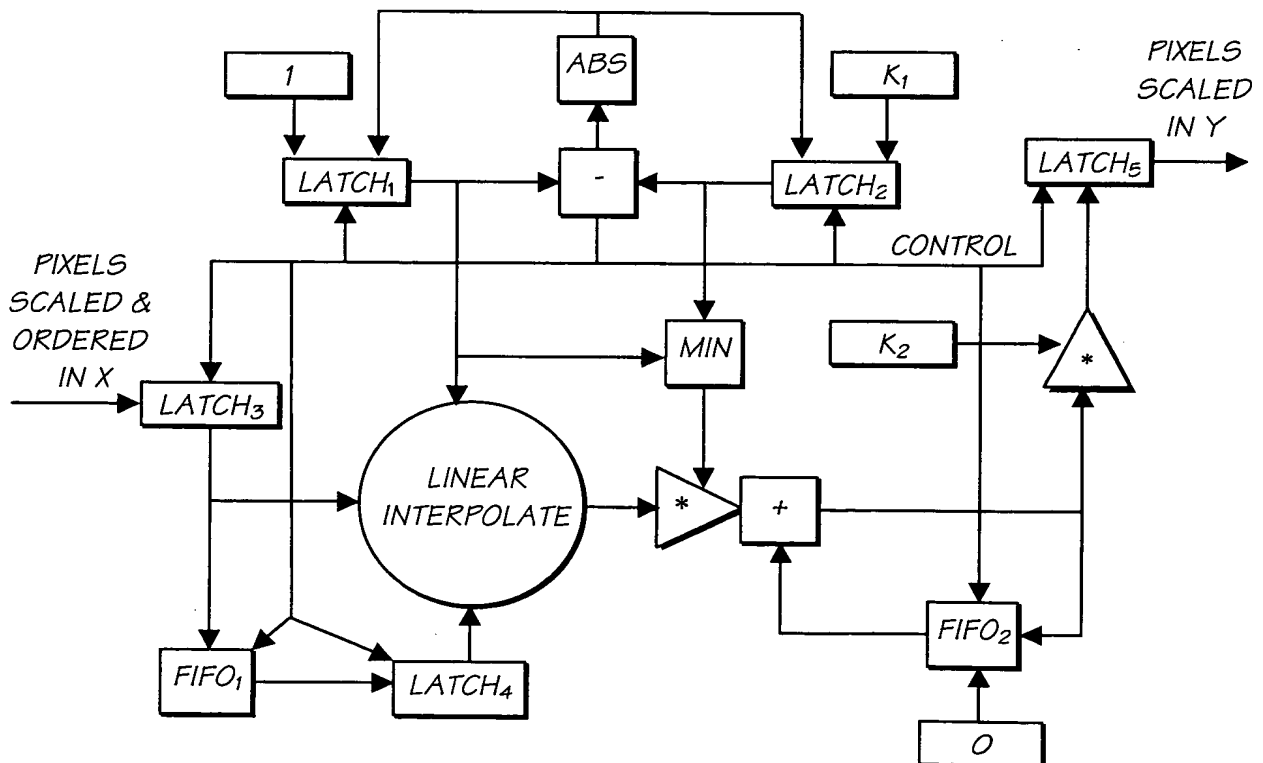
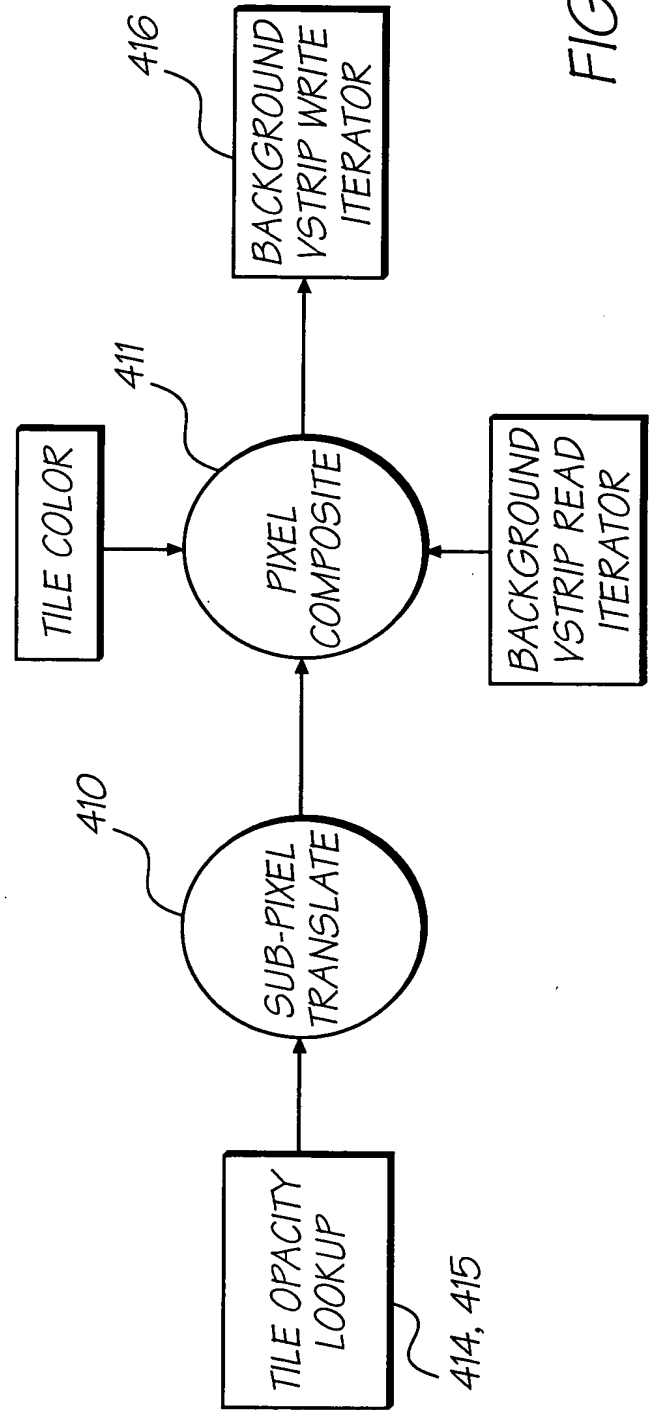
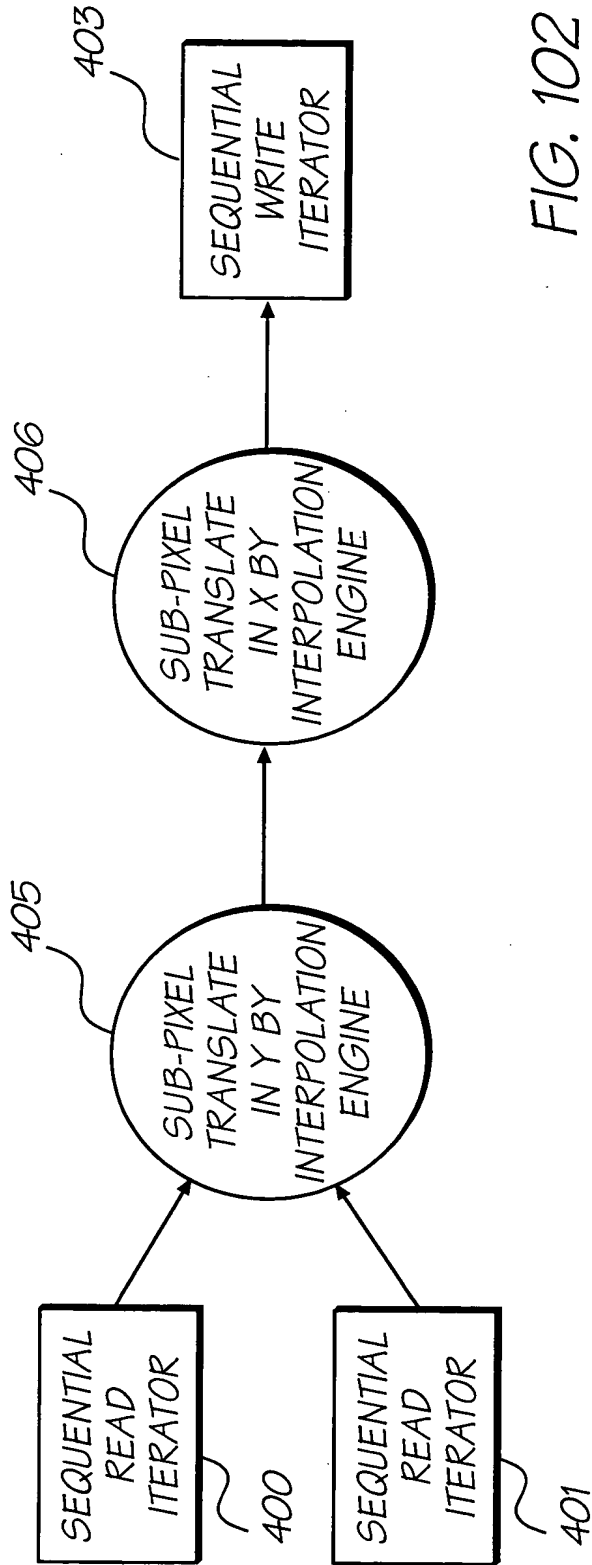
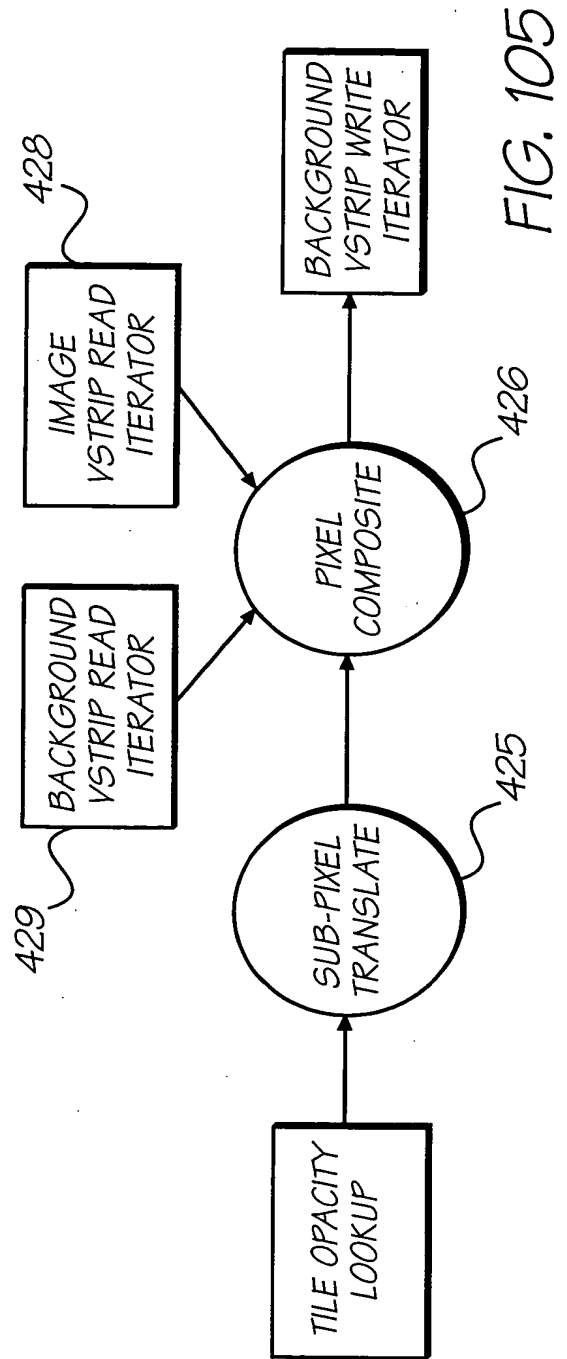
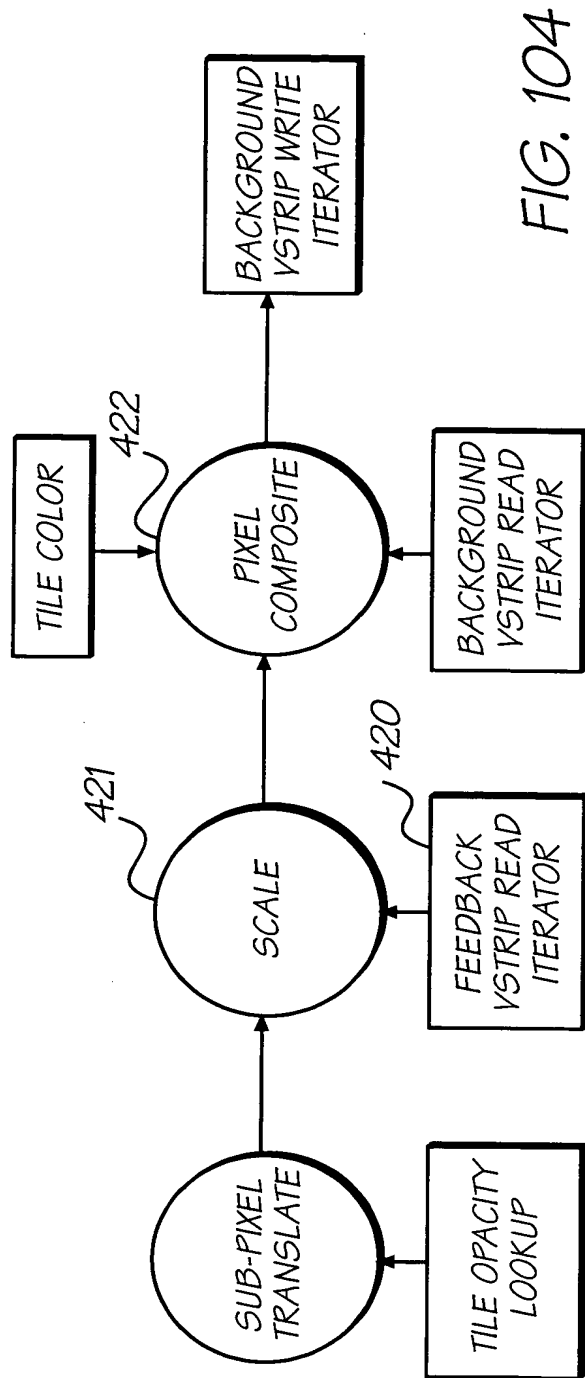


FIG. 100





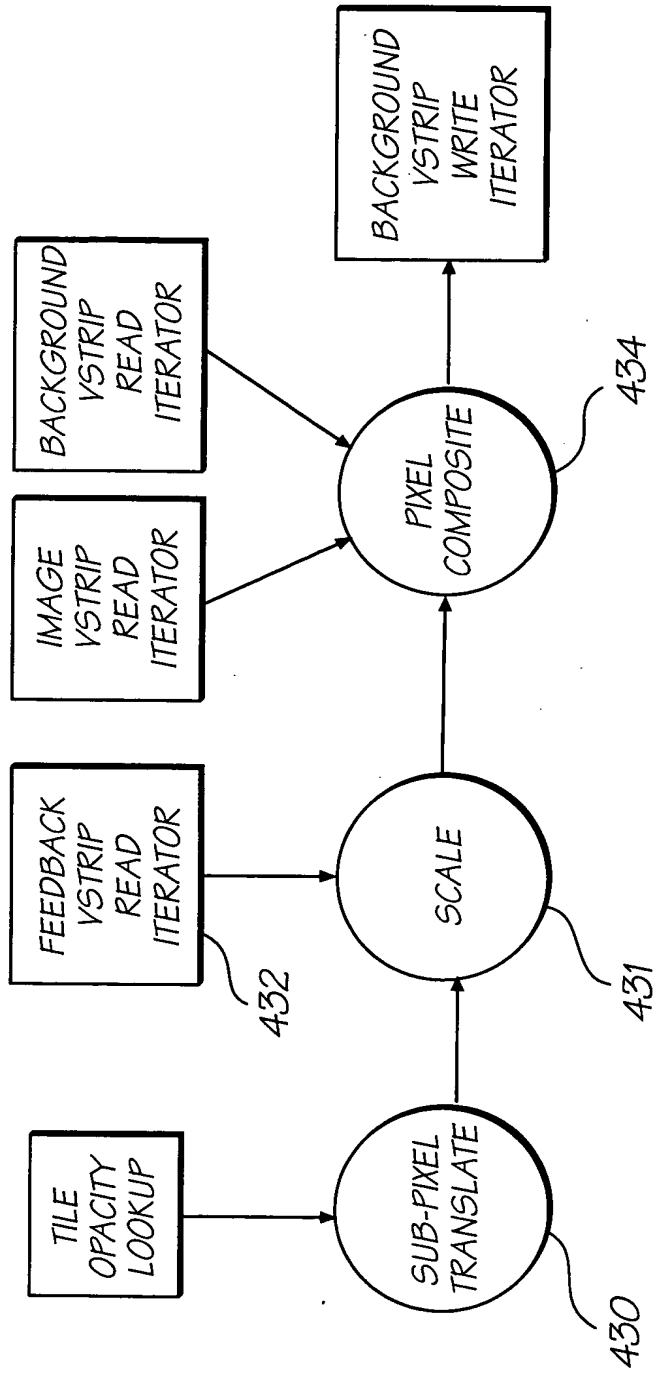


FIG. 106

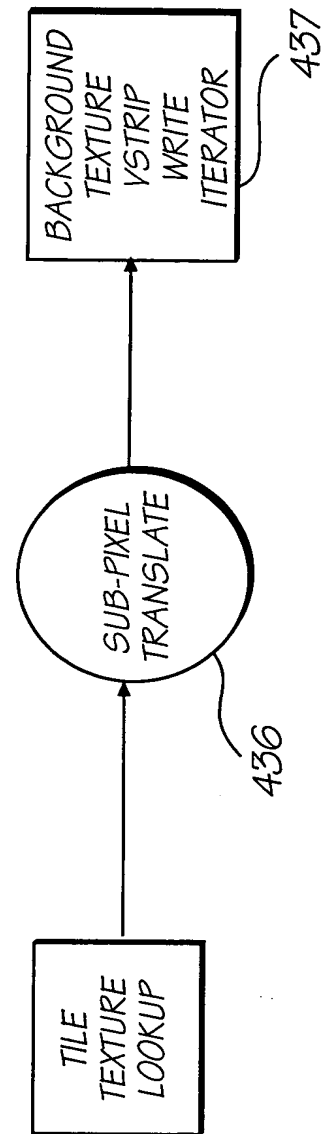


FIG. 107

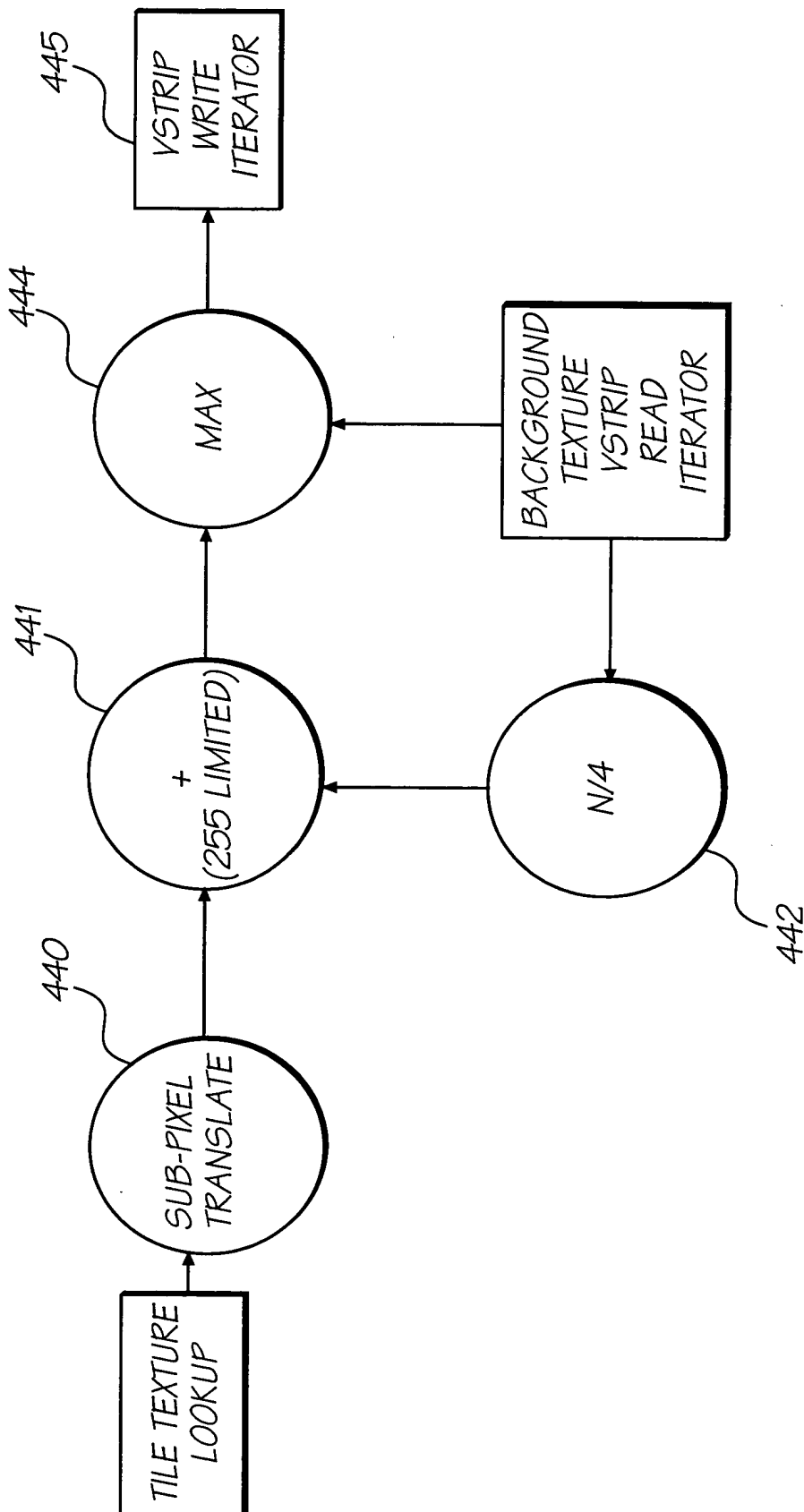


FIG. 108

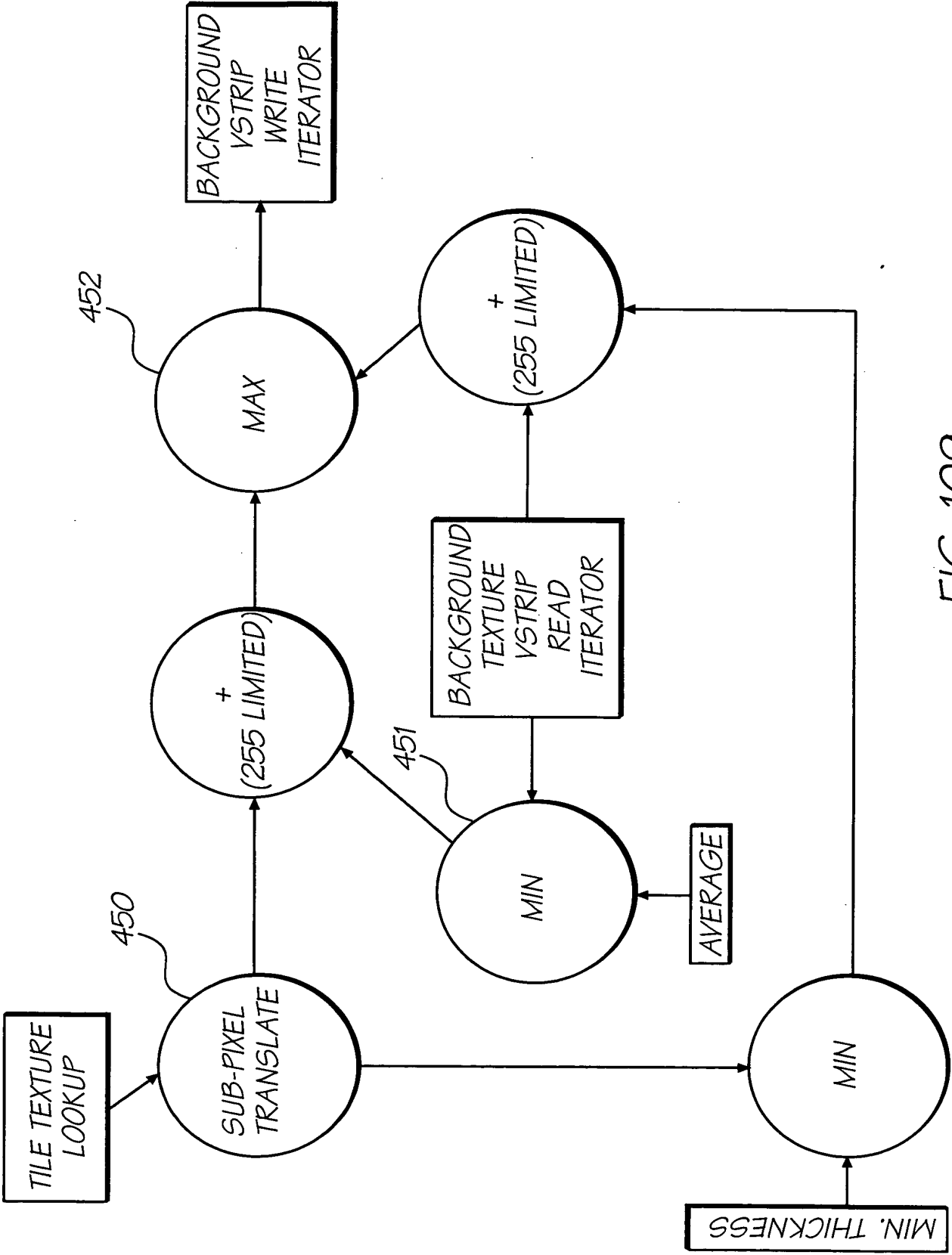


FIG. 109

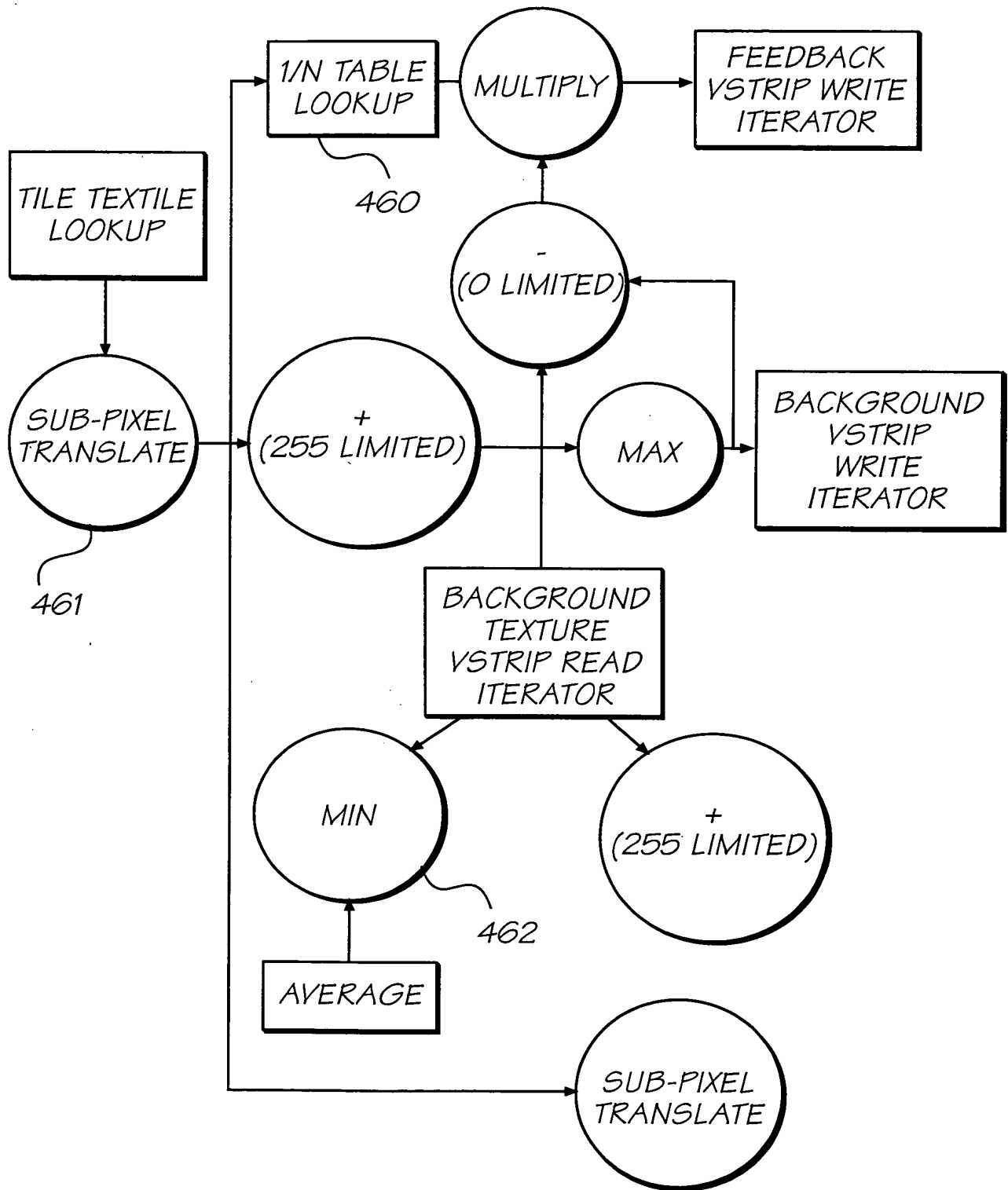


FIG. 110



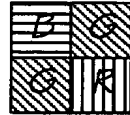
2X2 PIXEL BLOCK,
0 DEGREES



2X2 PIXEL BLOCK,
90 DEGREES

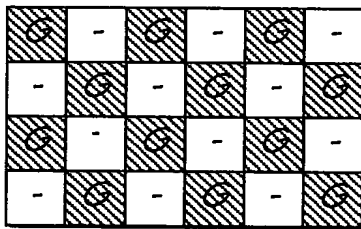


2X2 PIXEL BLOCK,
180 DEGREES



2X2 PIXEL BLOCK,
270 DEGREES

FIG. 111

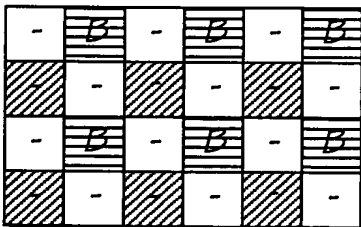


LINEAR INTERPOLATED PIXELS



ACTUAL PIXELS (NOT INTERPOLATED)

FIG. 112



LINEAR INTERPOLATED PIXELS

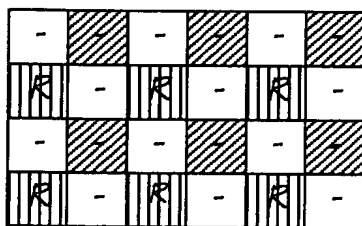


BI-LINEAR INTERPOLATED PIXELS



ACTUAL PIXELS (NOT INTERPOLATED)

FIG. 113



LINEAR INTERPOLATED PIXELS



BI-LINEAR INTERPOLATED PIXELS



ACTUAL PIXELS (NOT INTERPOLATED)

FIG. 114

61/140

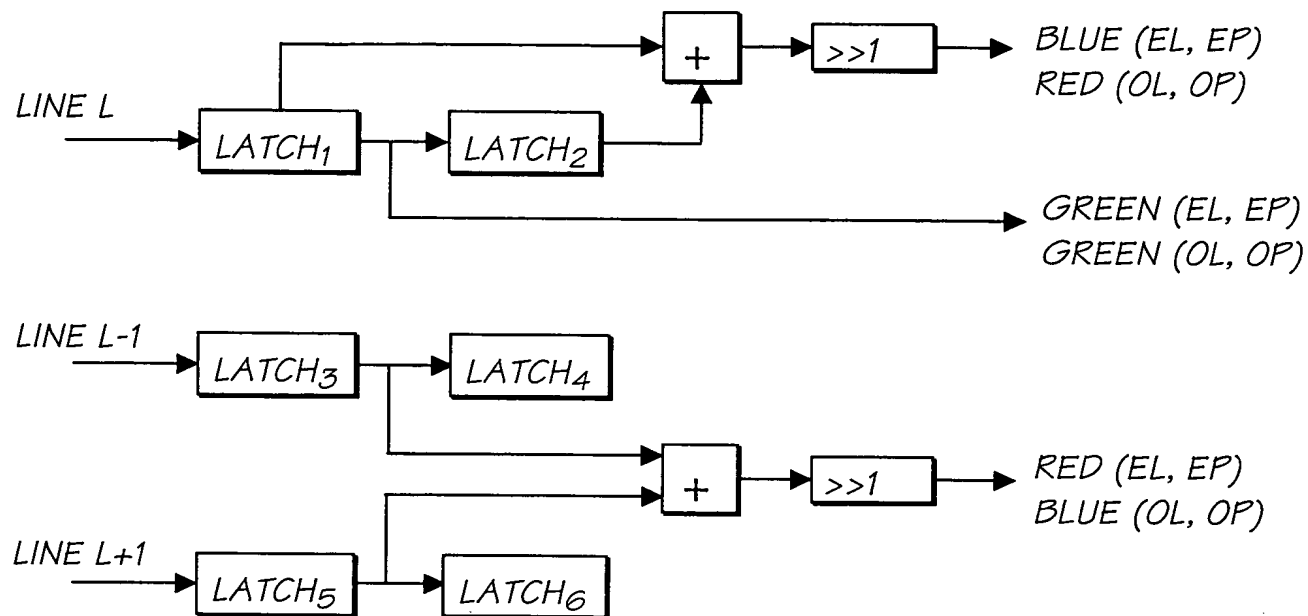


FIG. 115

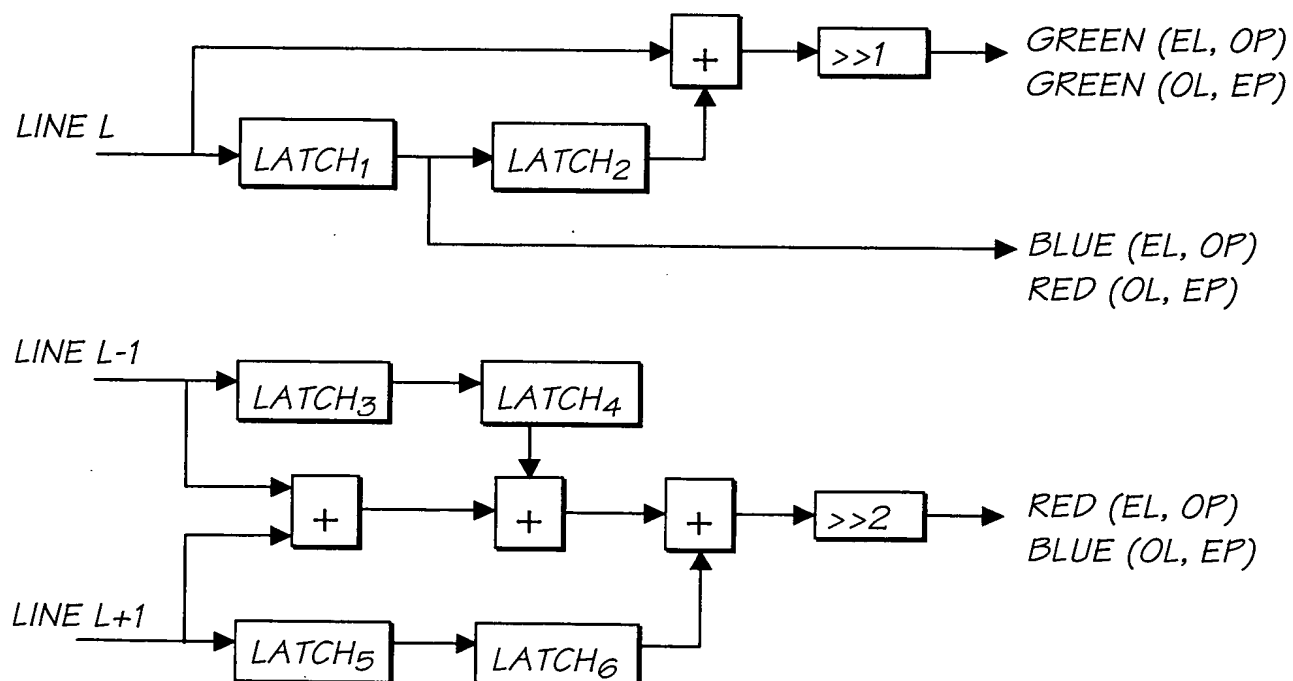


FIG. 116

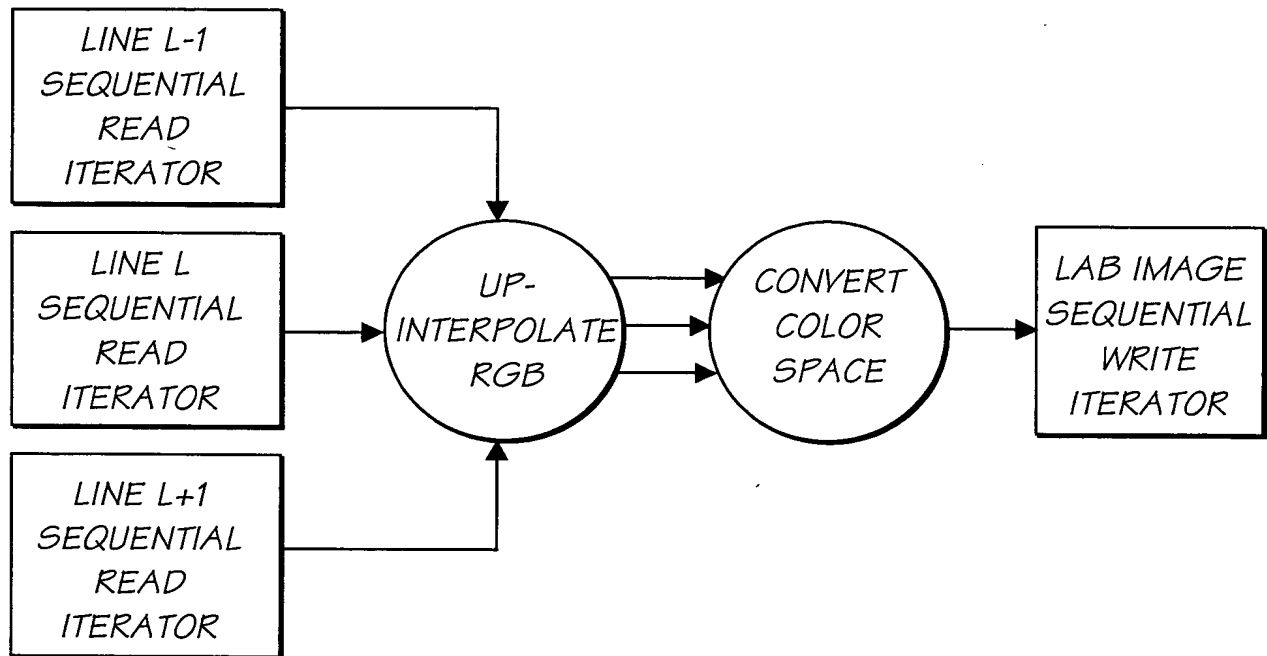


FIG. 117

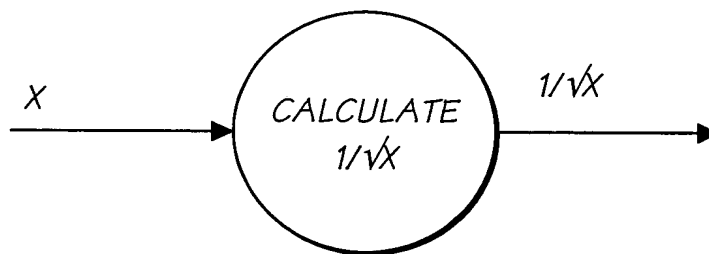


FIG. 118

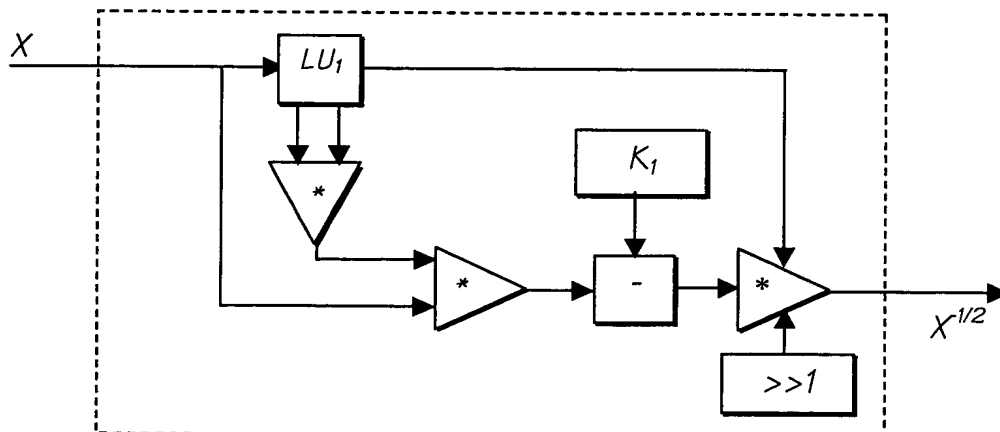


FIG. 119

```

graph LR
    A[BUMP-MAP LINE L - 1] --> C((Calculate N))
    B[BUMP-MAP LINE L] --> C
    D[BUMP-MAP LINE L + 1] --> C
    C --> E[X_N]
    C --> F[Y_N]
    C --> G[1/|IN|]
  
```

FIG. 122

64/140

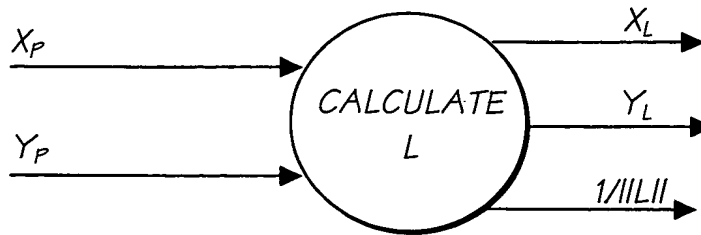


FIG. 123

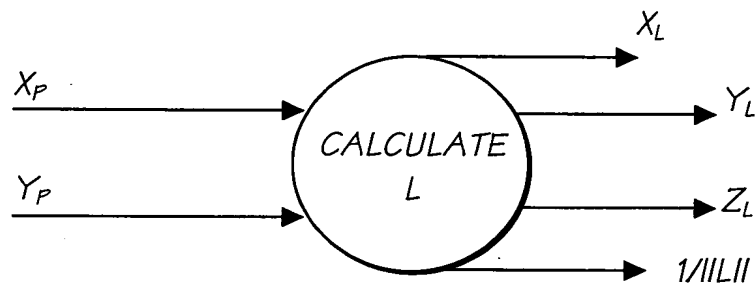


FIG. 124

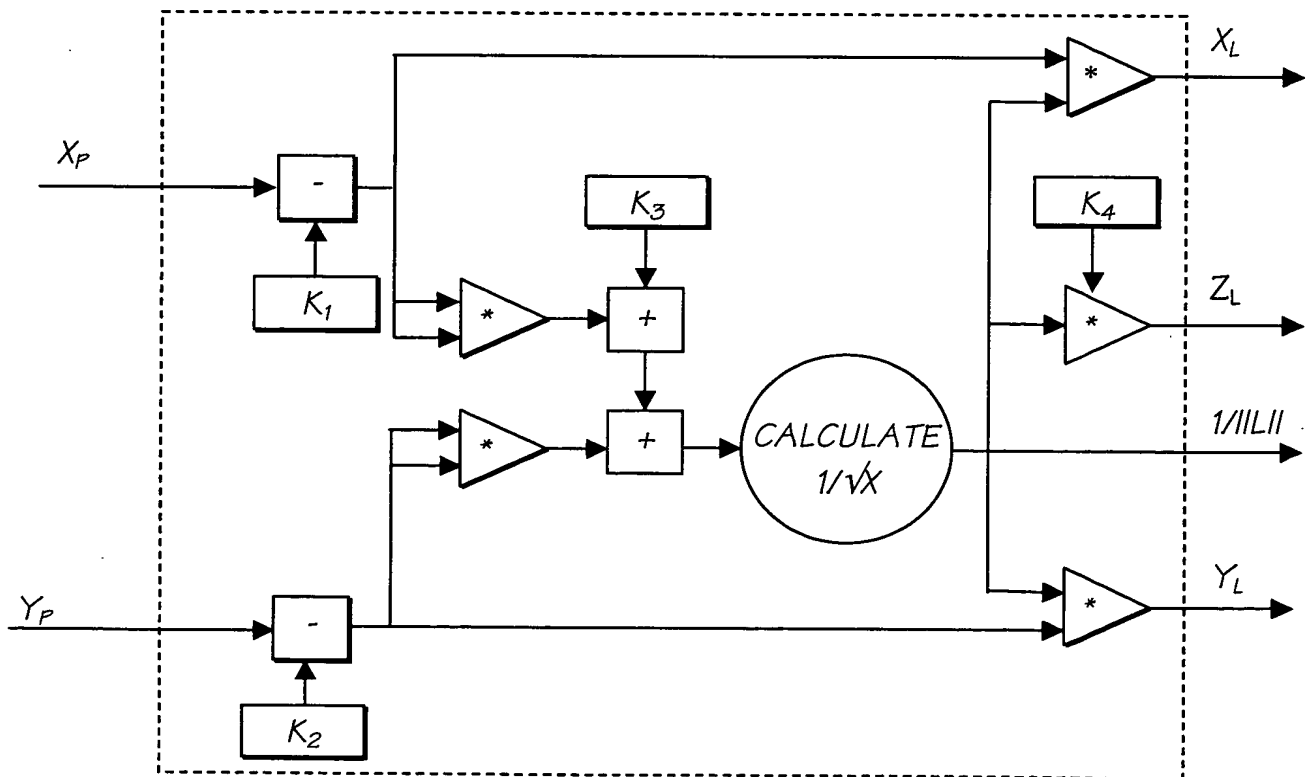


FIG. 125

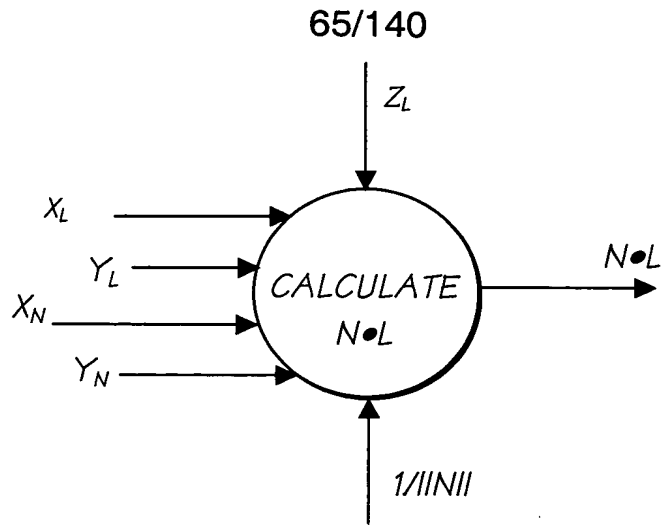


FIG. 126

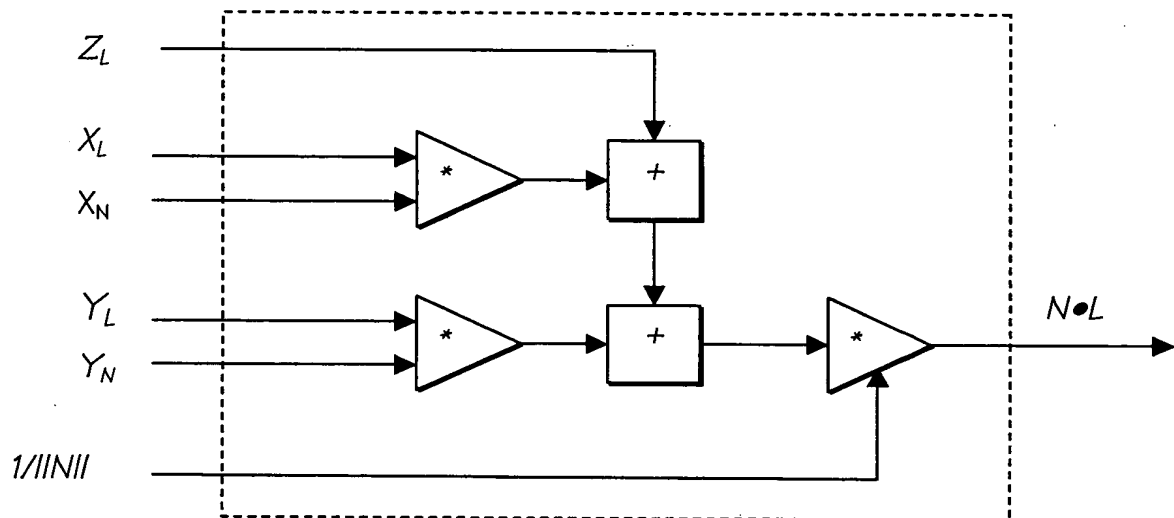


FIG. 127

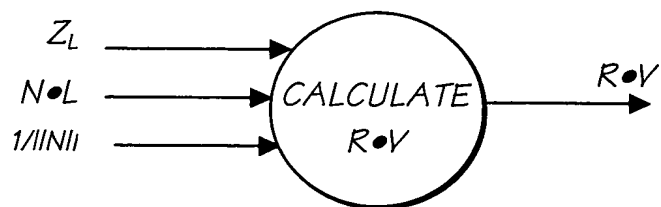


FIG. 128

66/140

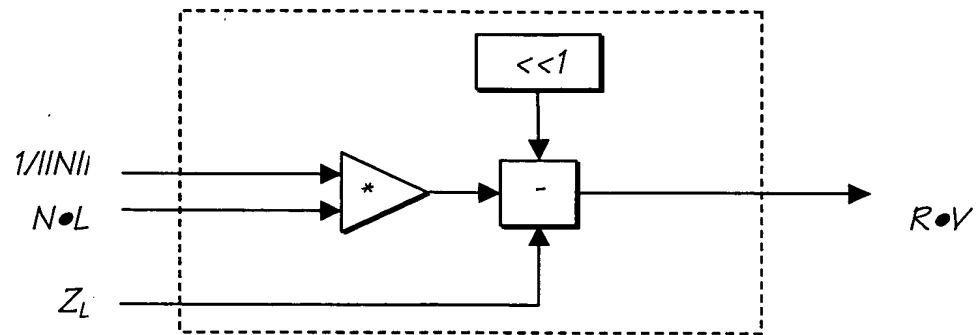


FIG. 129

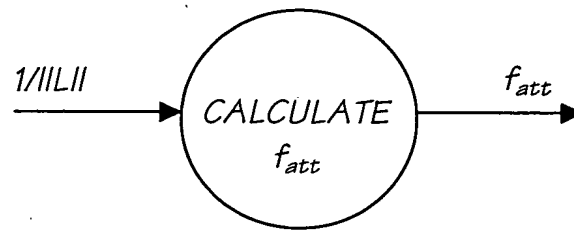


FIG. 130

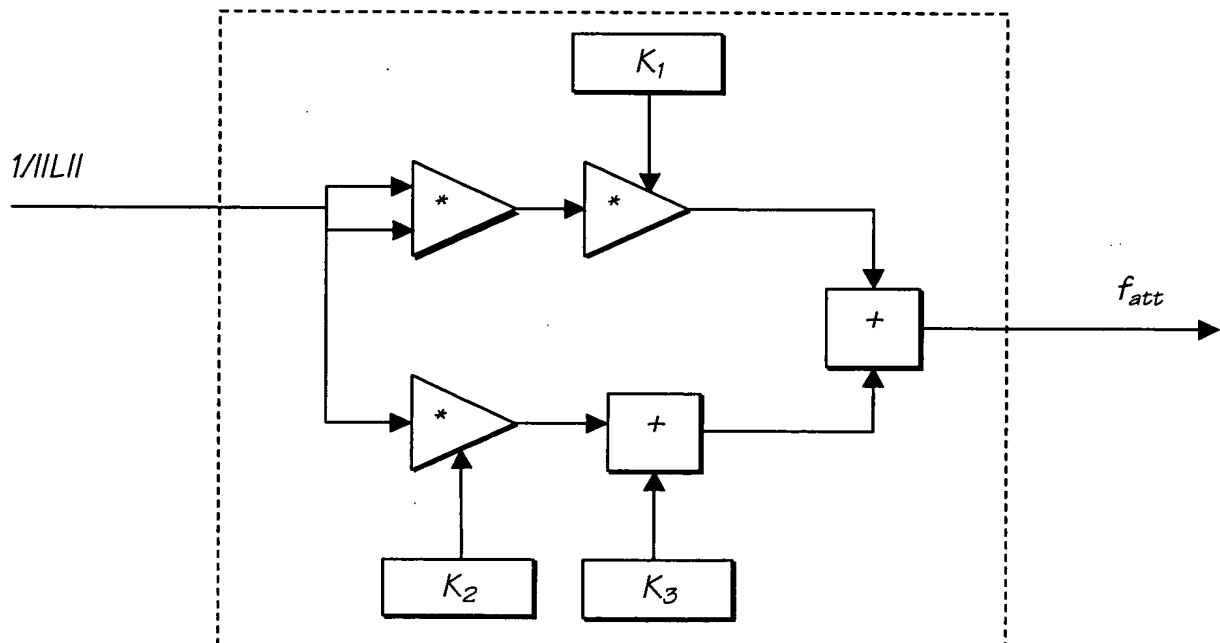


FIG. 131

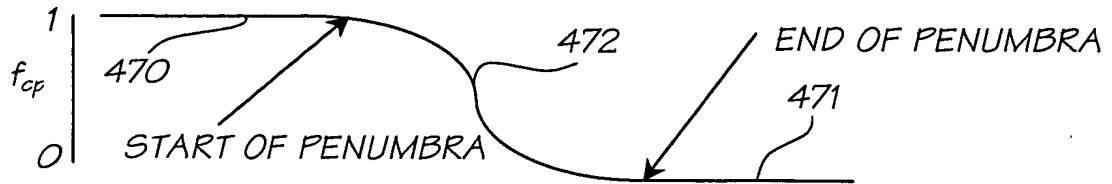


FIG. 132

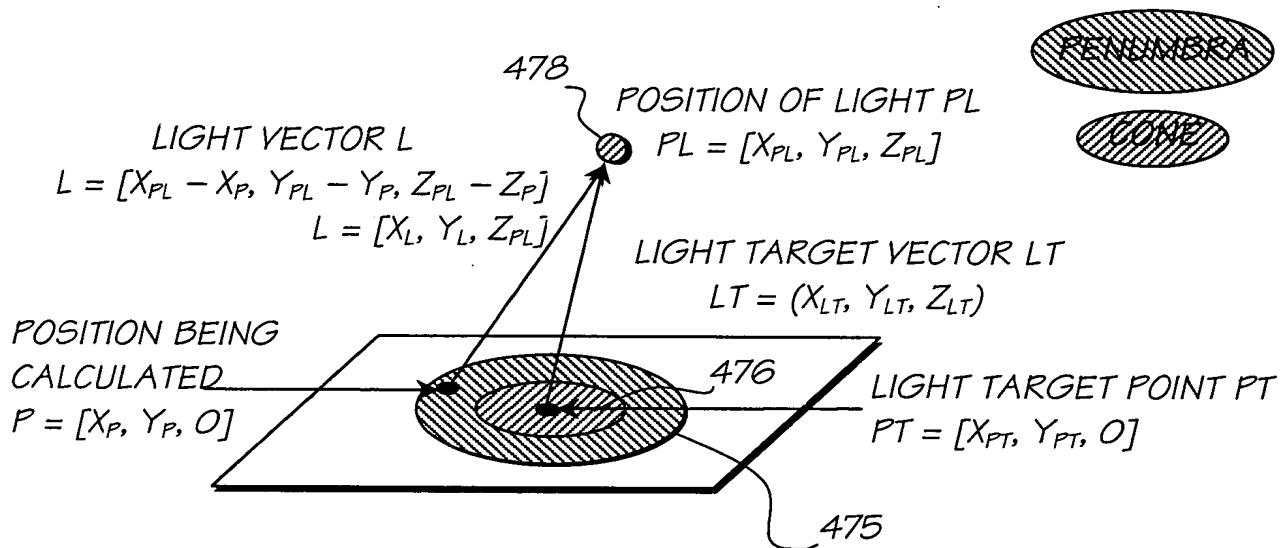


FIG. 133

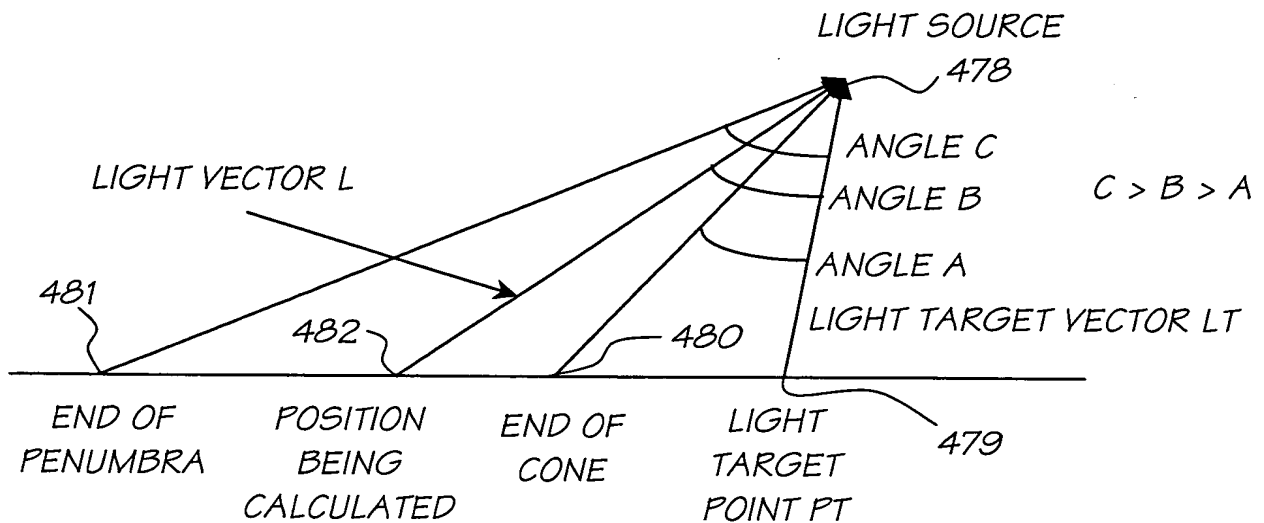


FIG. 134

68/140

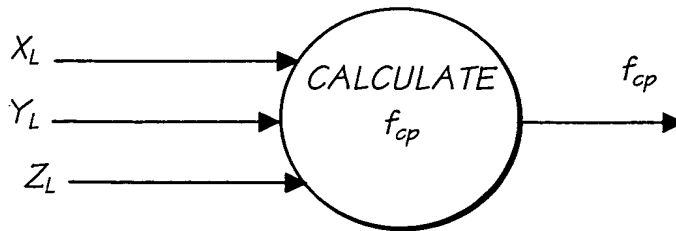


FIG. 135

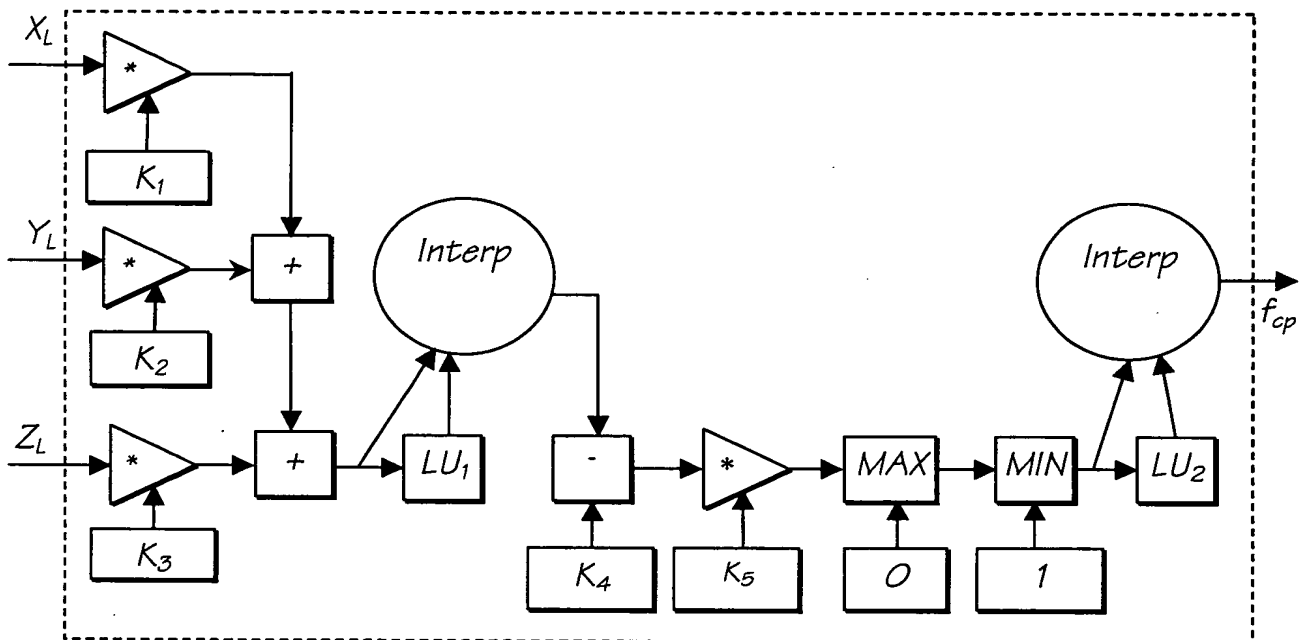


FIG. 136

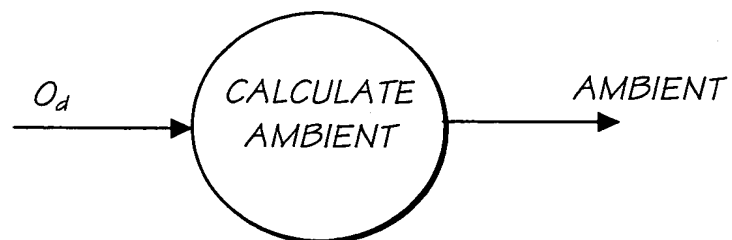


FIG. 137

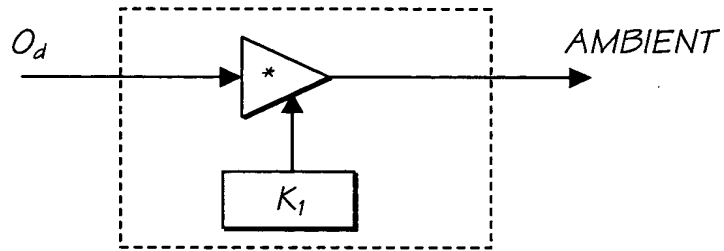


FIG. 138

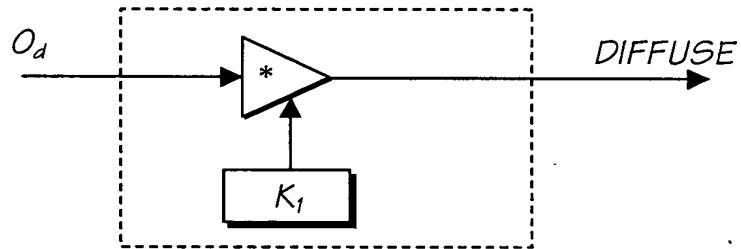


FIG. 139

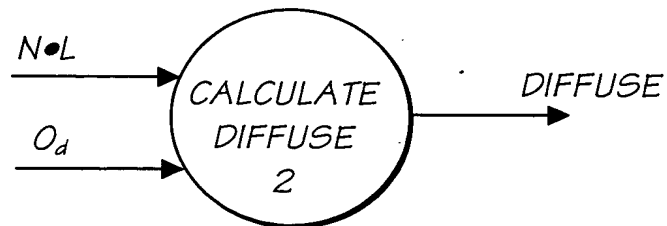


FIG. 140

70/140

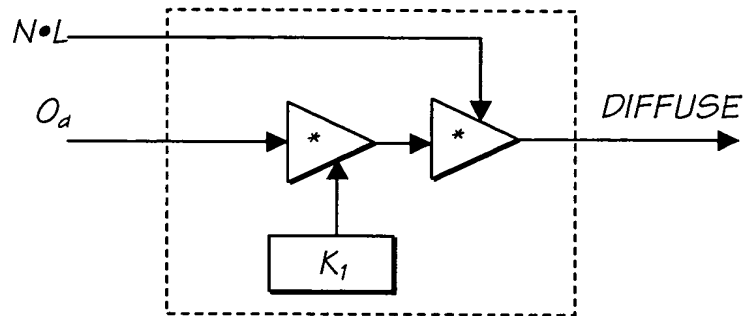


FIG. 141

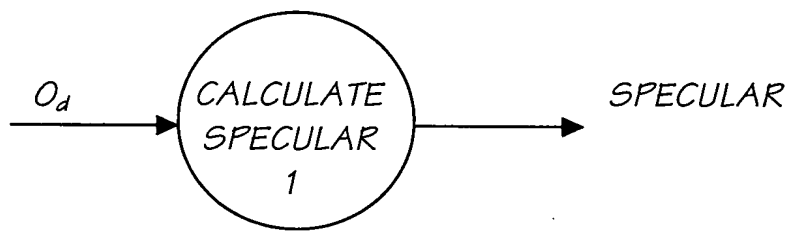


FIG. 142

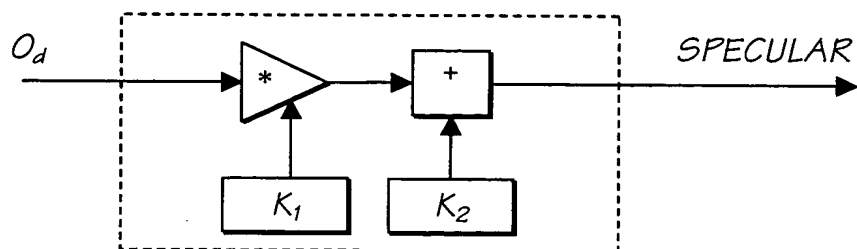


FIG. 143

71/140

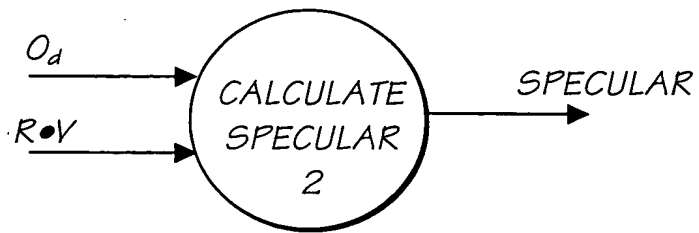


FIG. 144

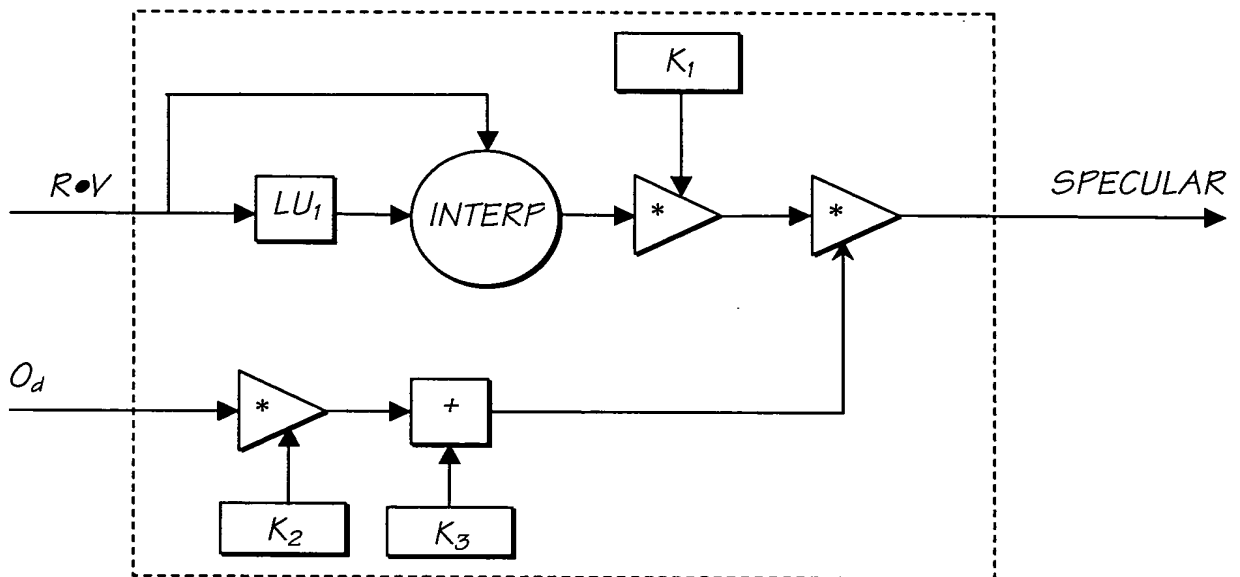


FIG. 145

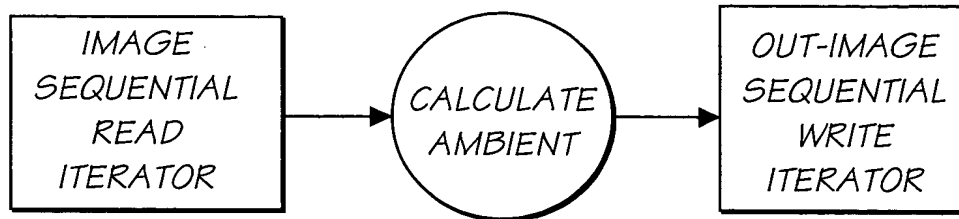


FIG. 146

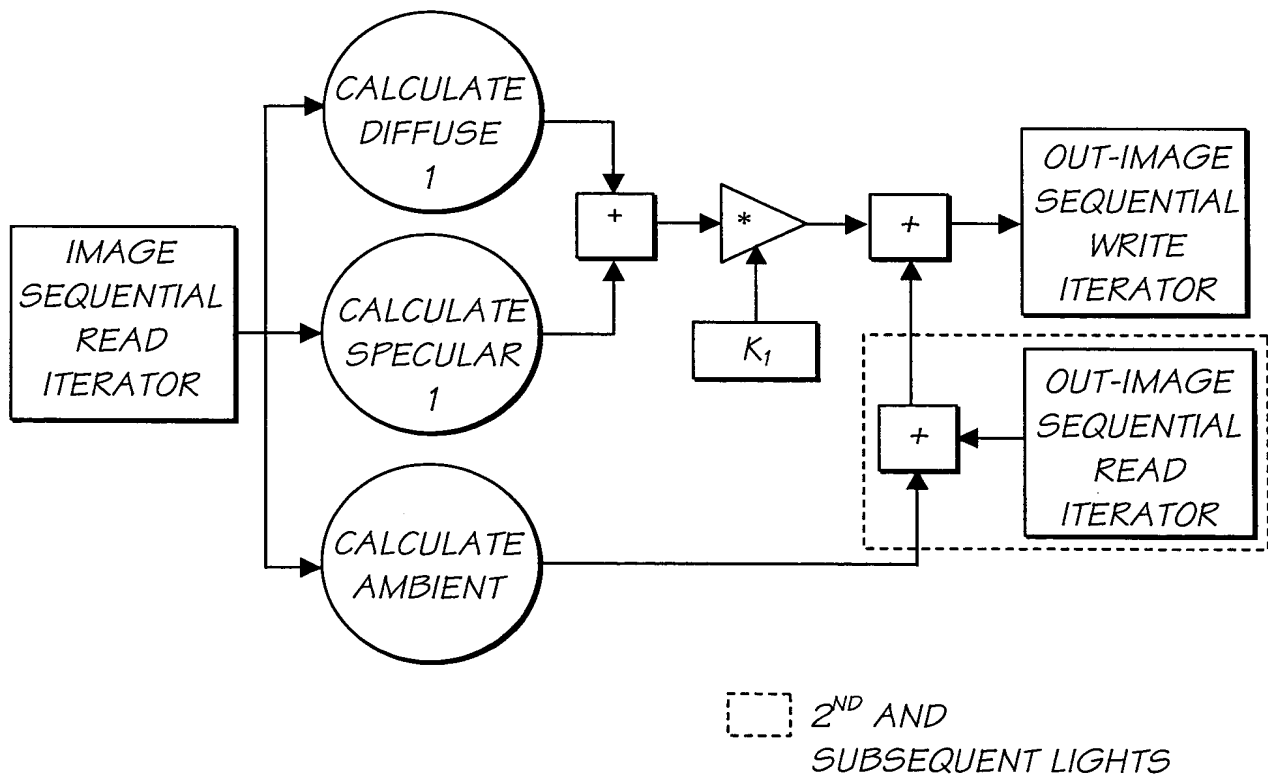


FIG. 147

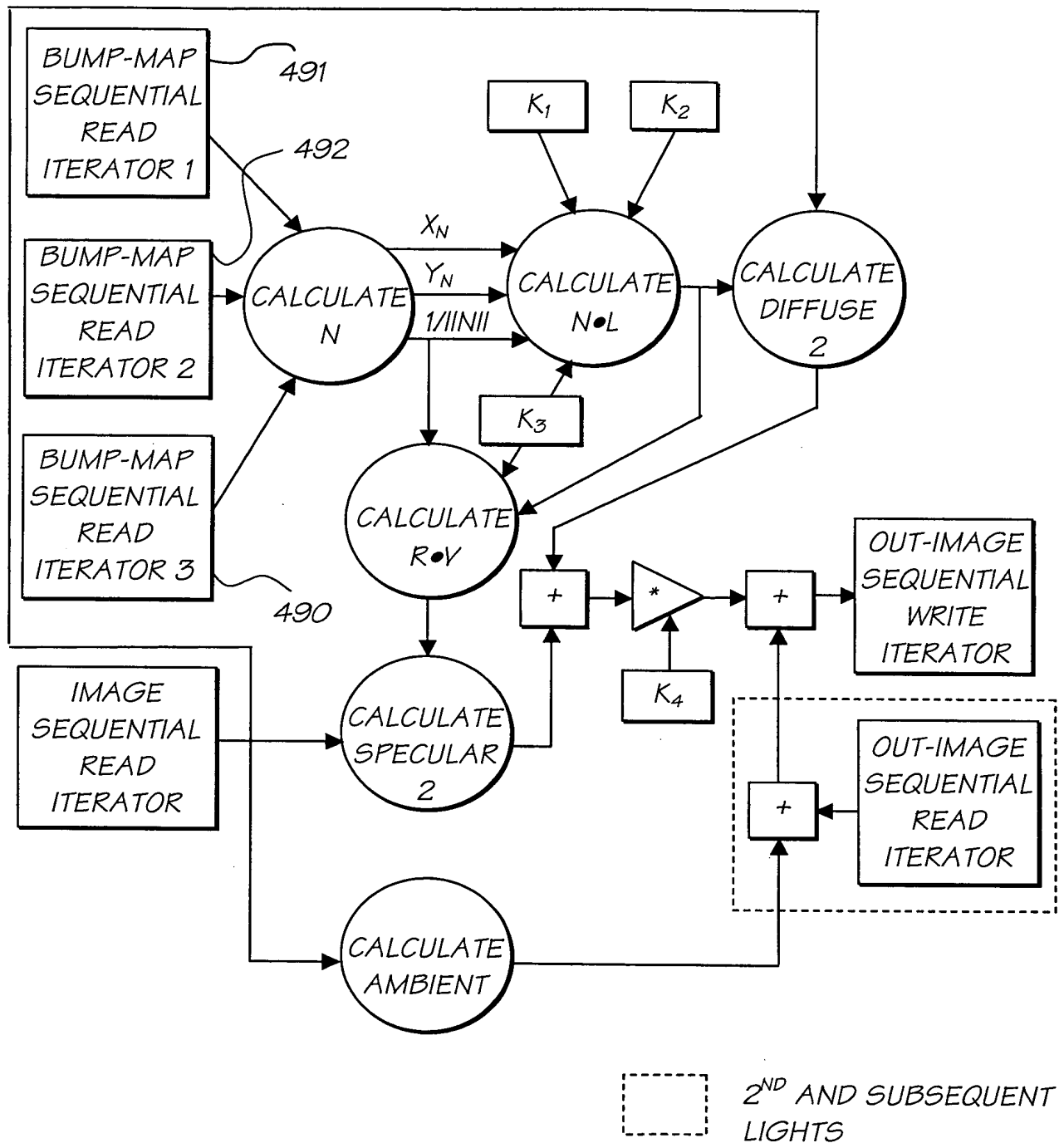


FIG. 148

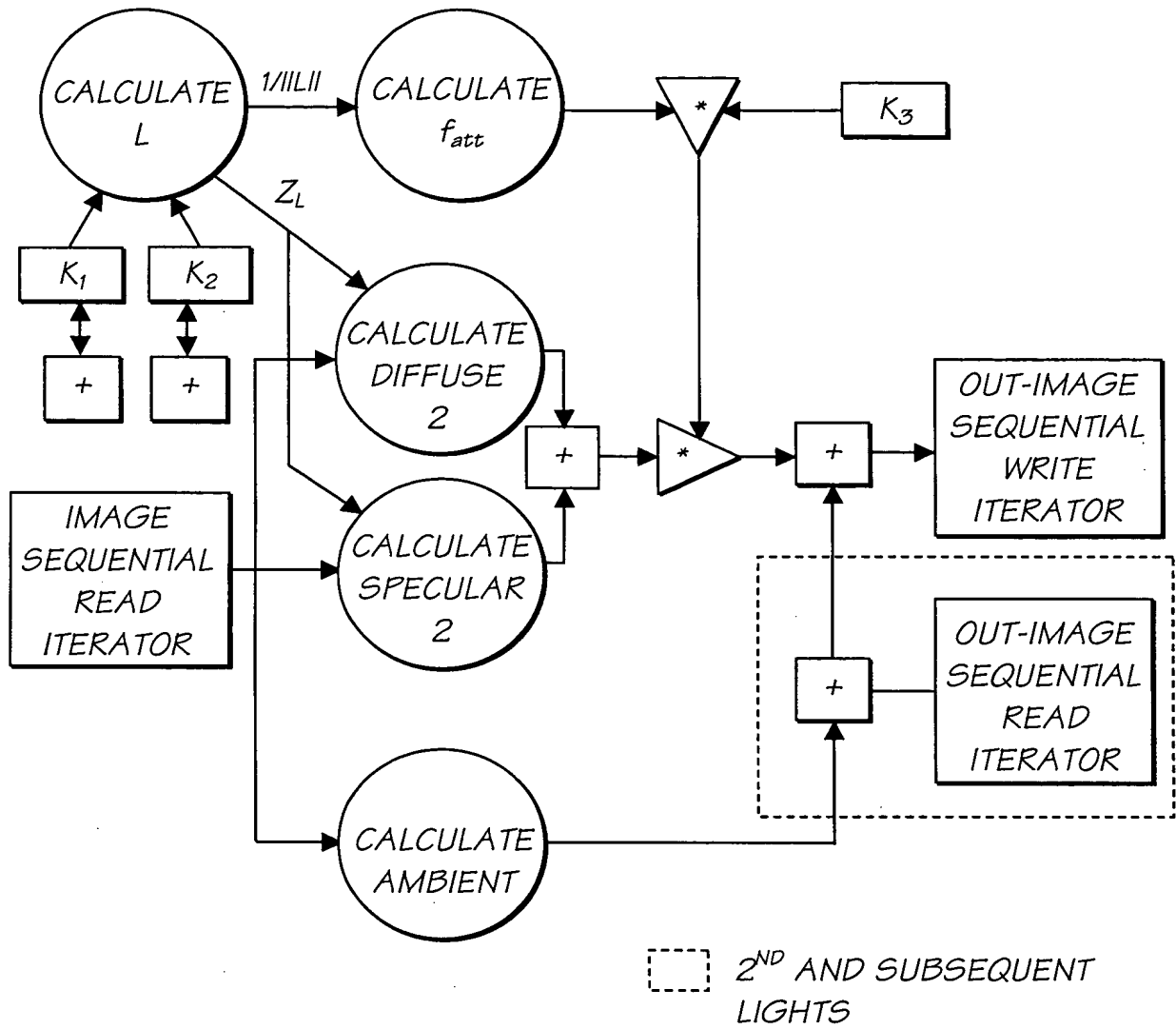


FIG. 149

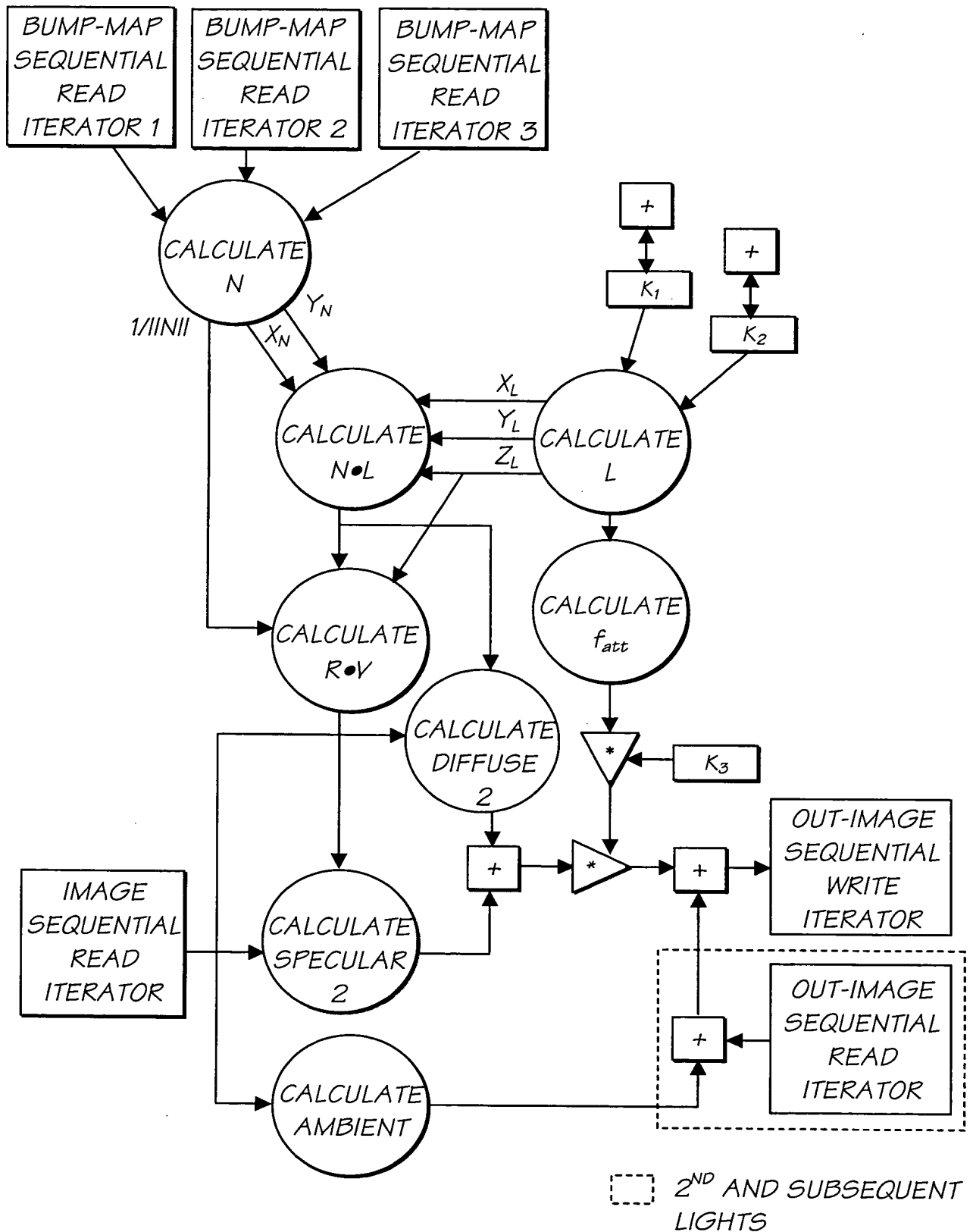


FIG. 150

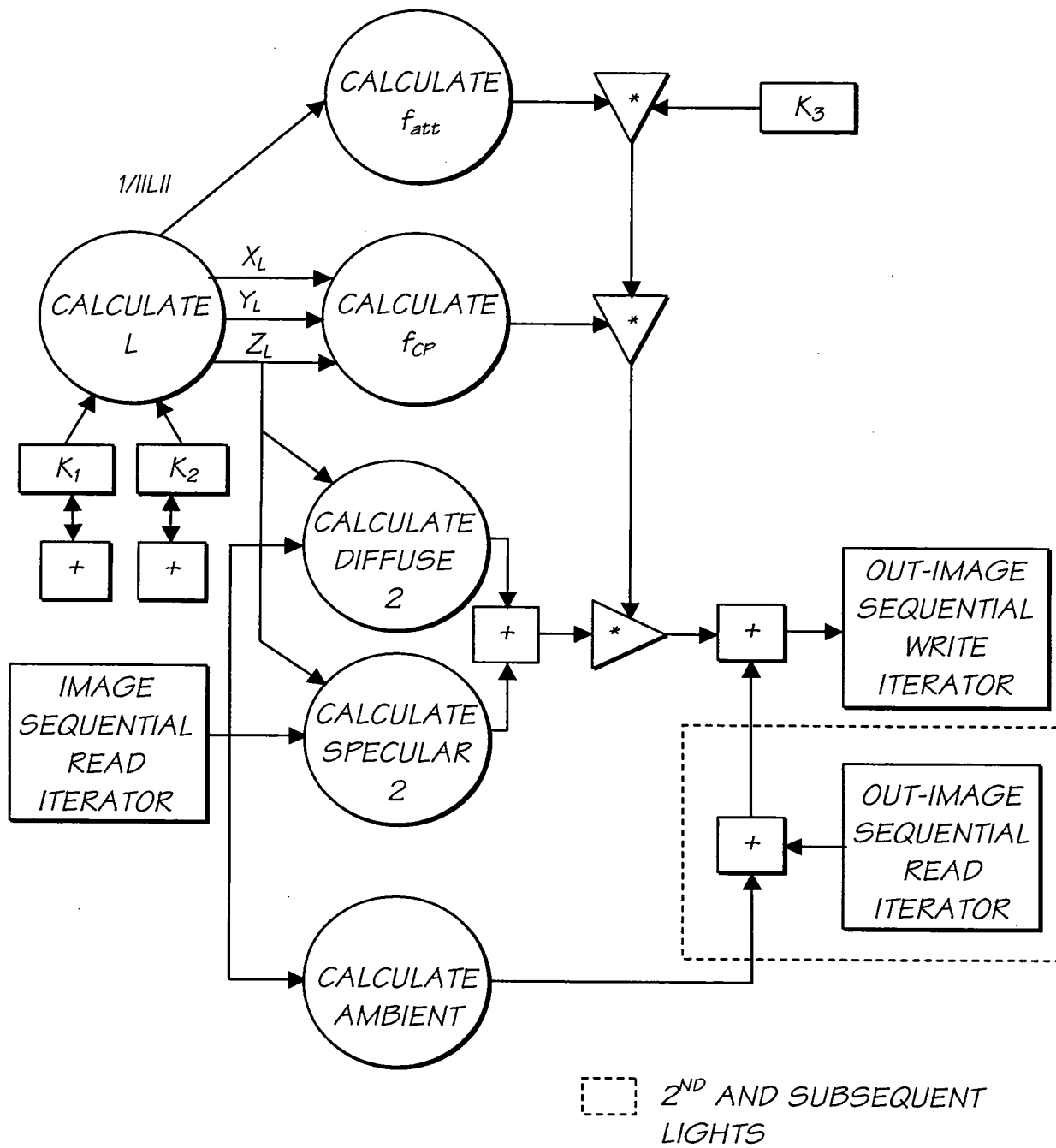


FIG. 151

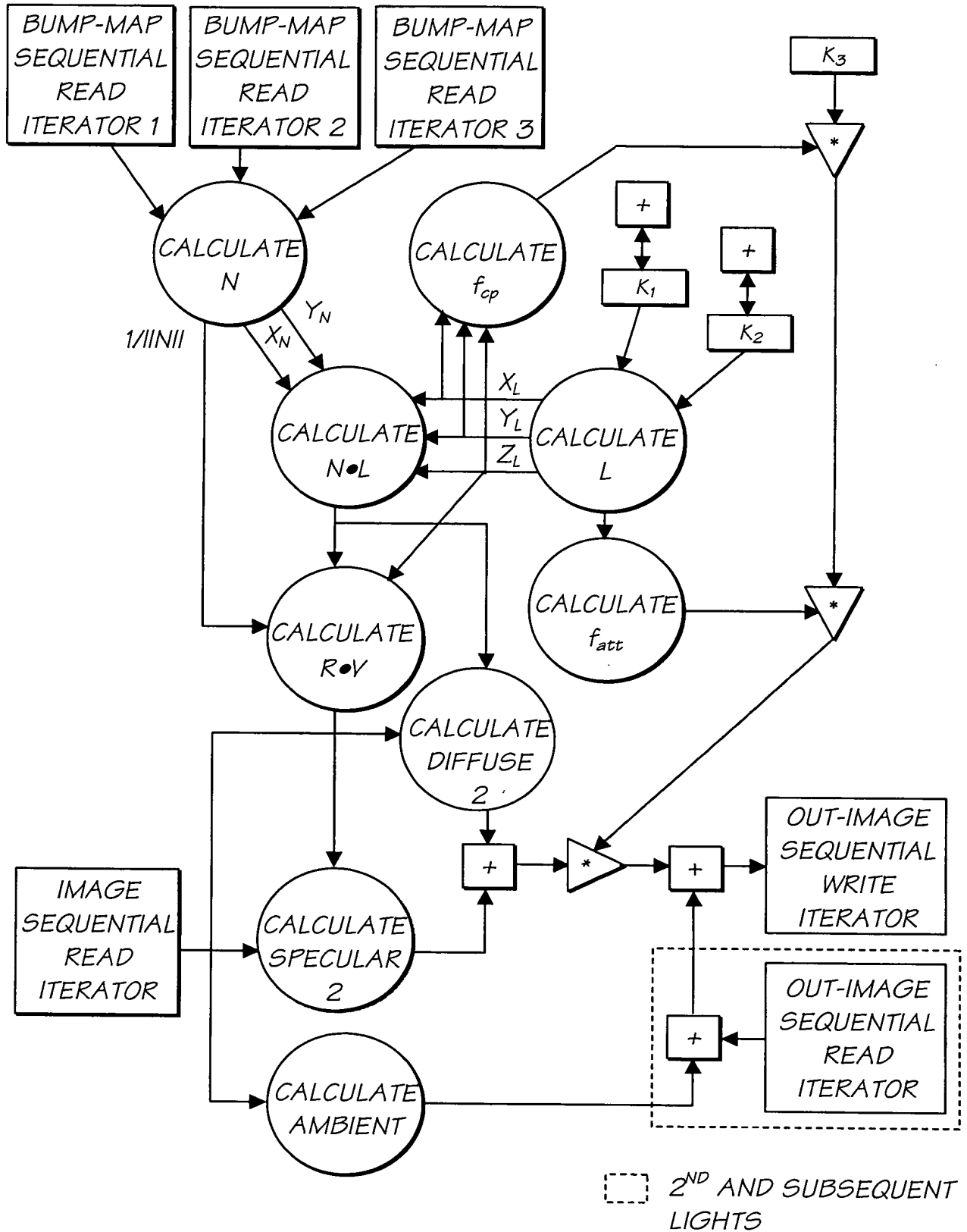
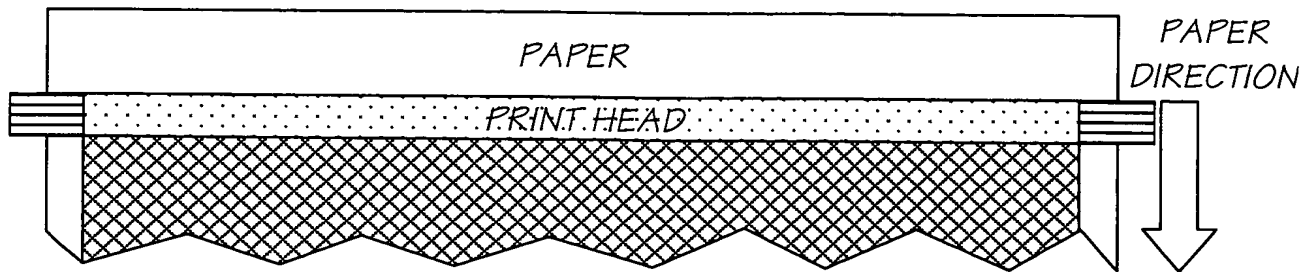


FIG. 152

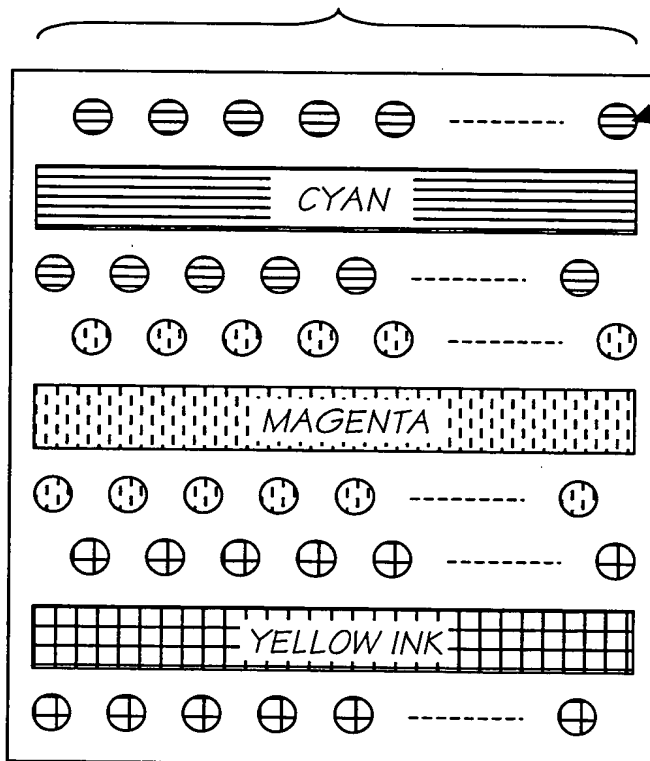
78/140



8 PRINT HEAD SEGMENTS IN PRINT HEAD

SEGMENT	SEGMENT	SEGMENT	SEGMENT	SEGMENT	SEGMENT	SEGMENT	SEGMENT
0	1	2	3	4	5	6	7

1250 μM (375 DOTS PER SEGMENT ROW,
OR 750 DOTS PER SEGMENT COLOR)



1 DOT IS 16.6 μM IN
DIAMETER

(A 100 μM SQUARE =
6 X 6 = 36 DOTS)

466.6 μM
(28 DOTS)

33.3 μM
(2 DOTS)

133.3 μM
(8 DOTS)

EACH SEGMENT CONTAINS 6 ROWS OF DOTS:
ODD AND EVEN CYAN, MAGENTA, AND YELLOW.

FIG. 153

79/140

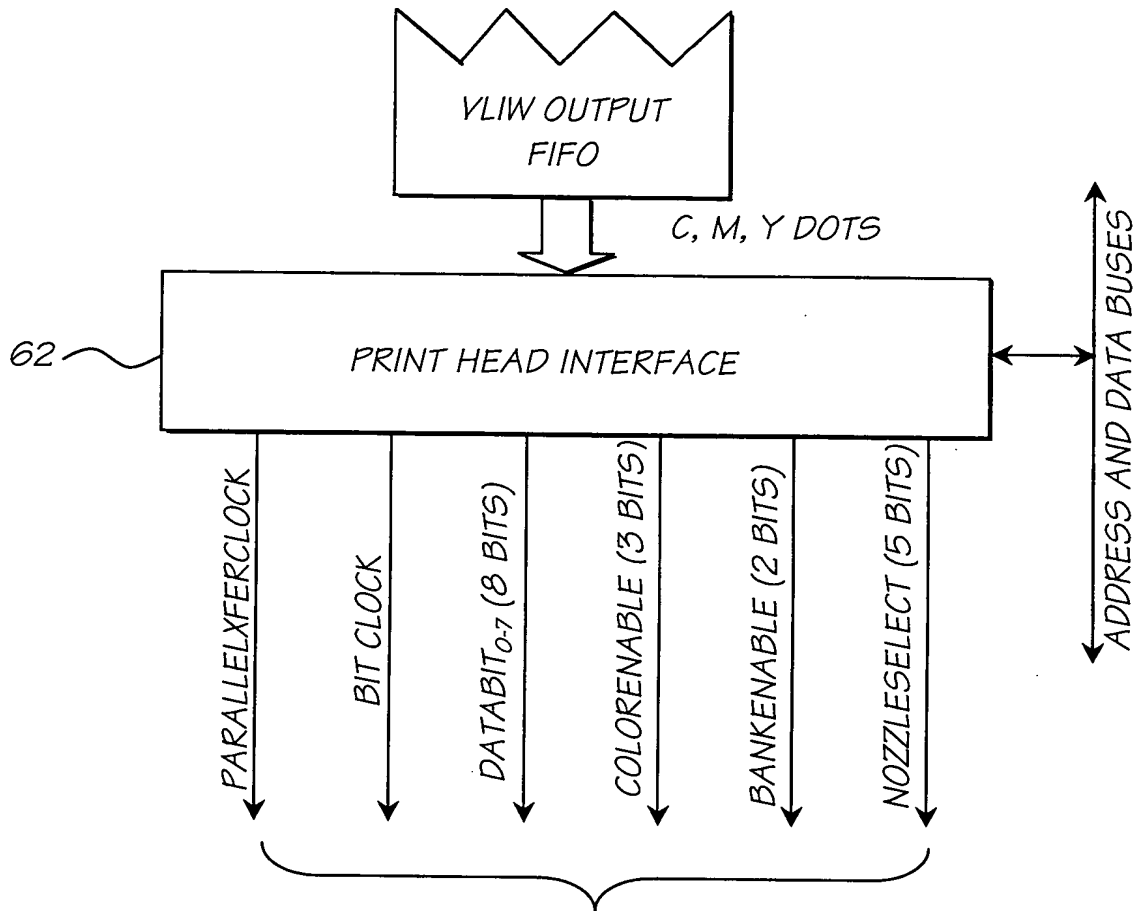


FIG. 154

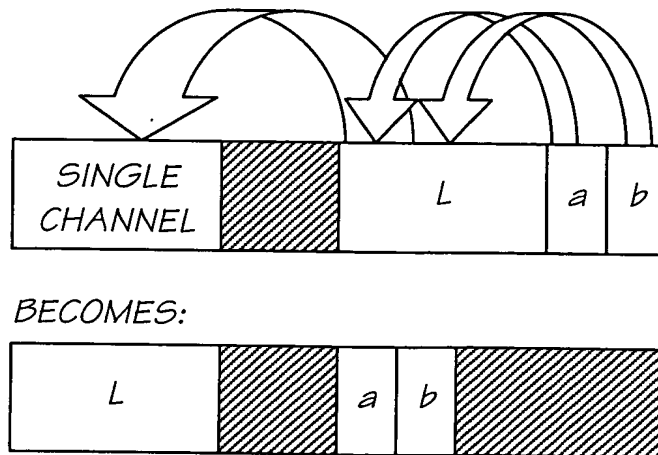


FIG. 155

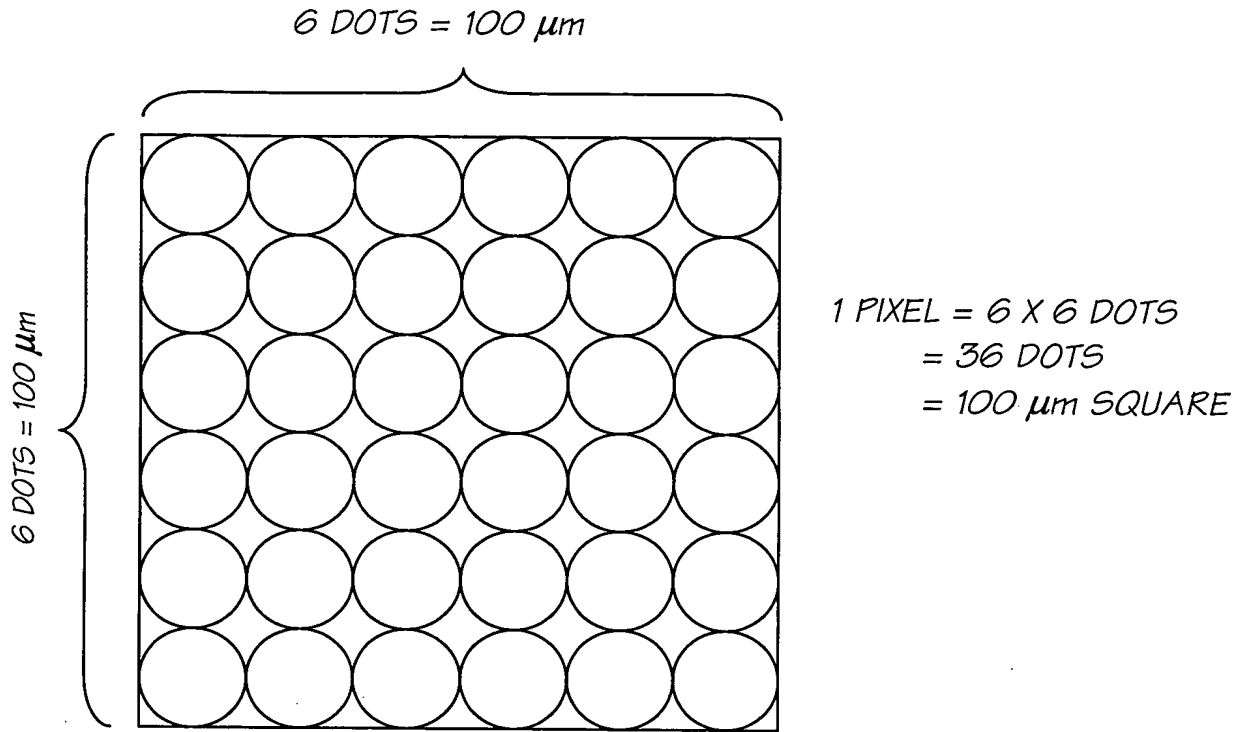


FIG. 156

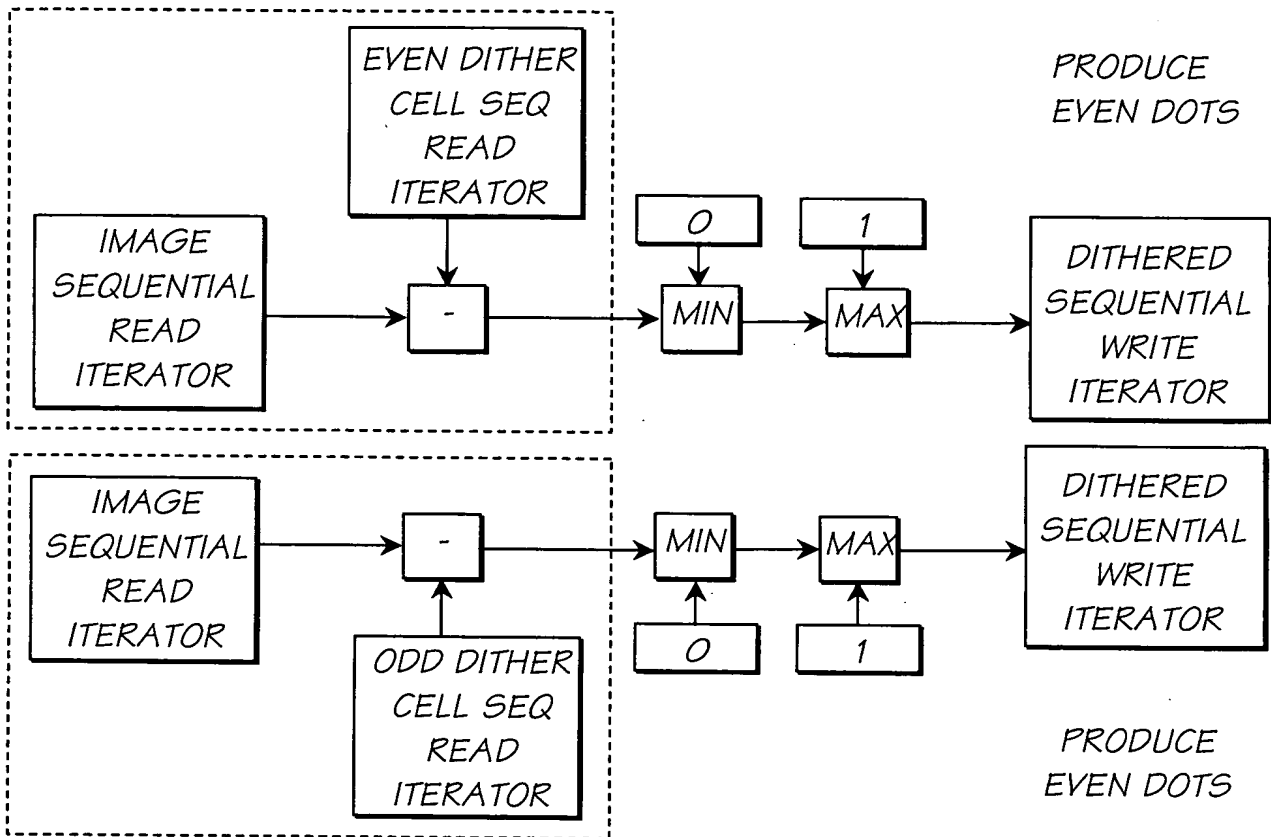


FIG. 157

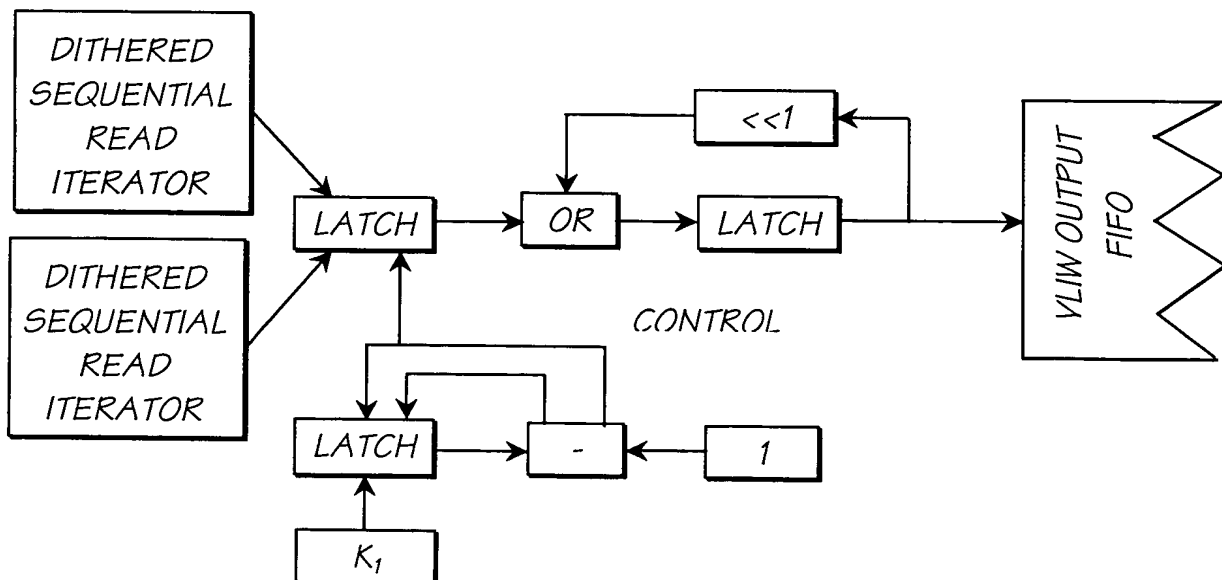
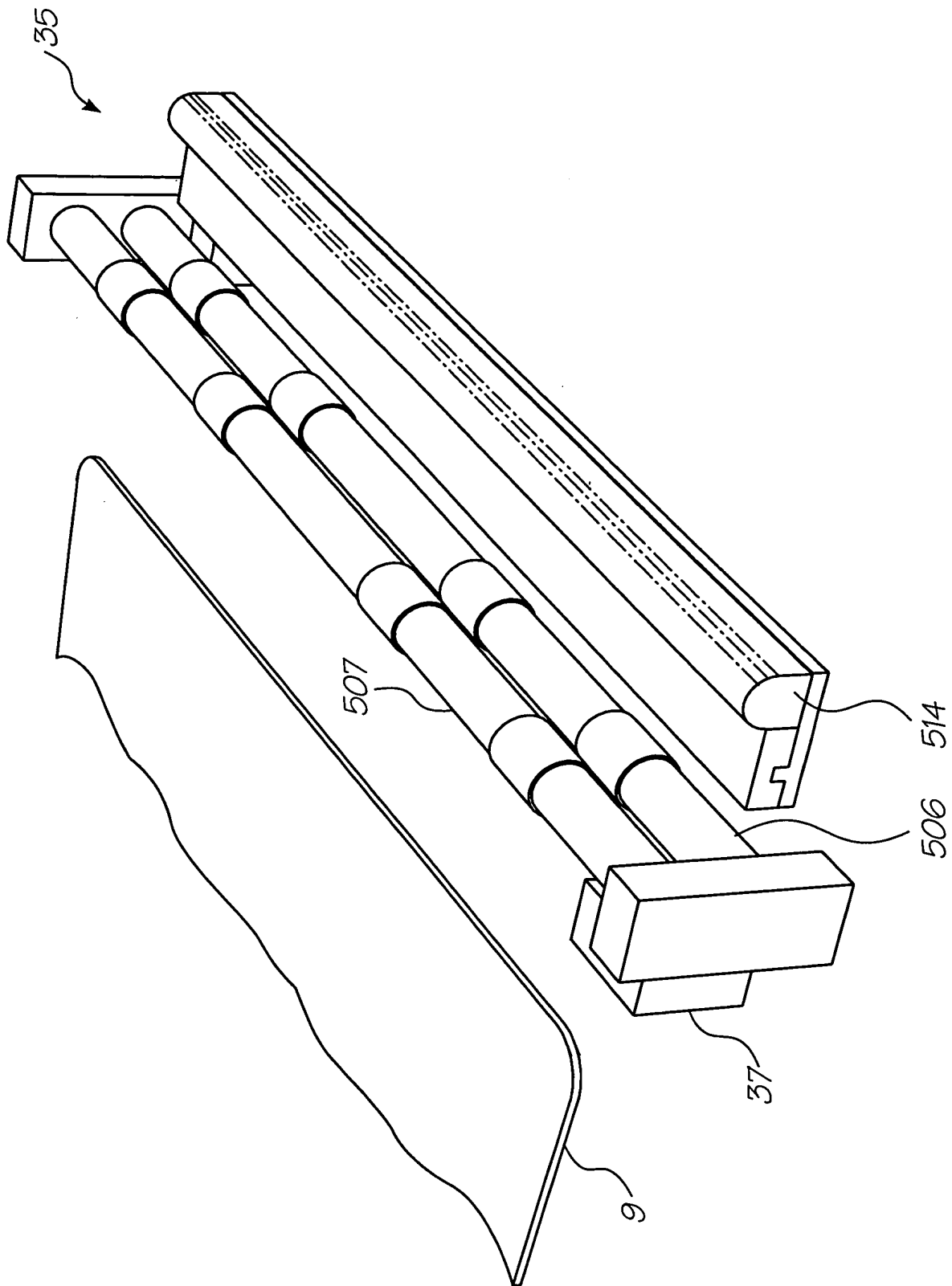
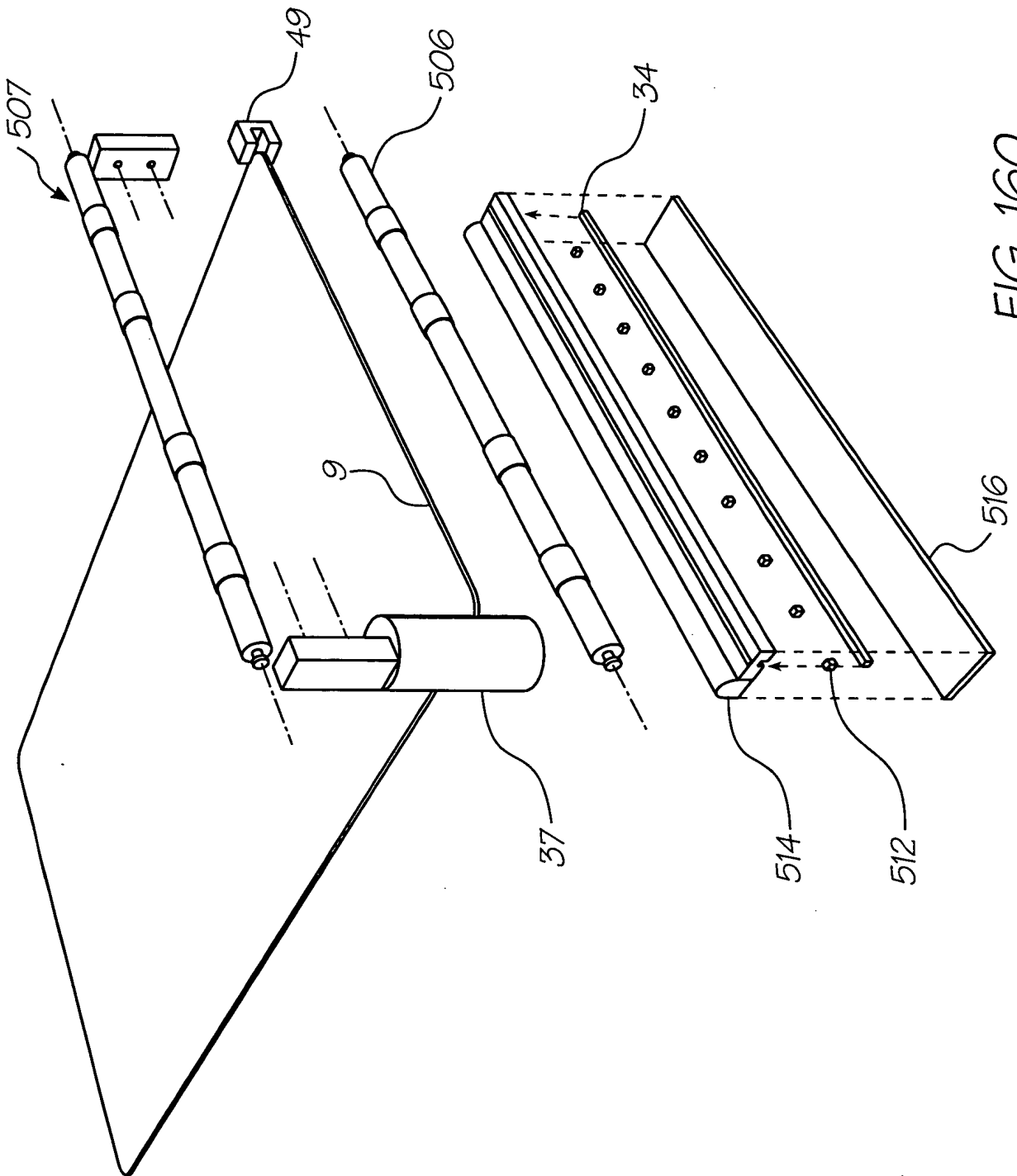


FIG. 158





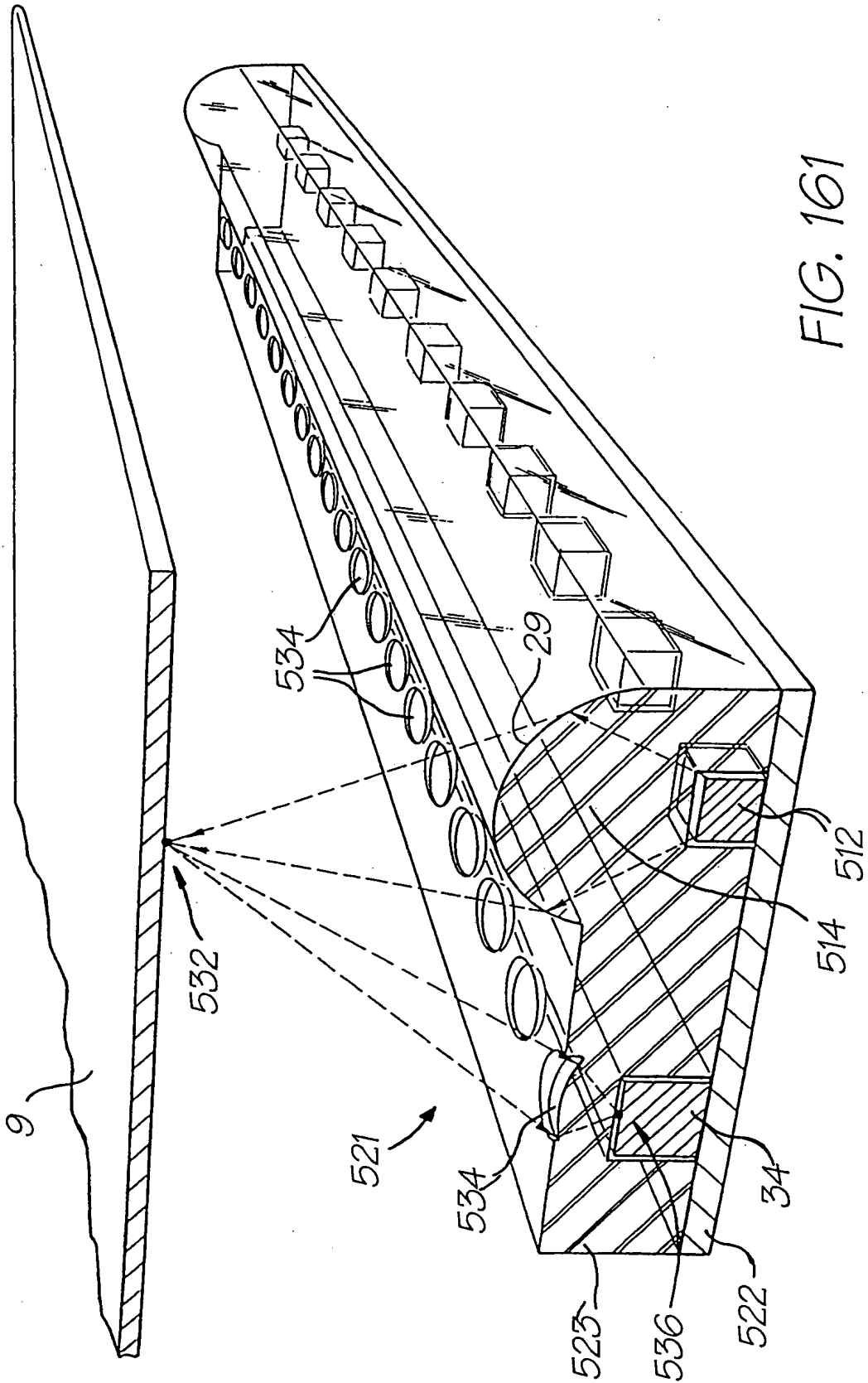


FIG. 161

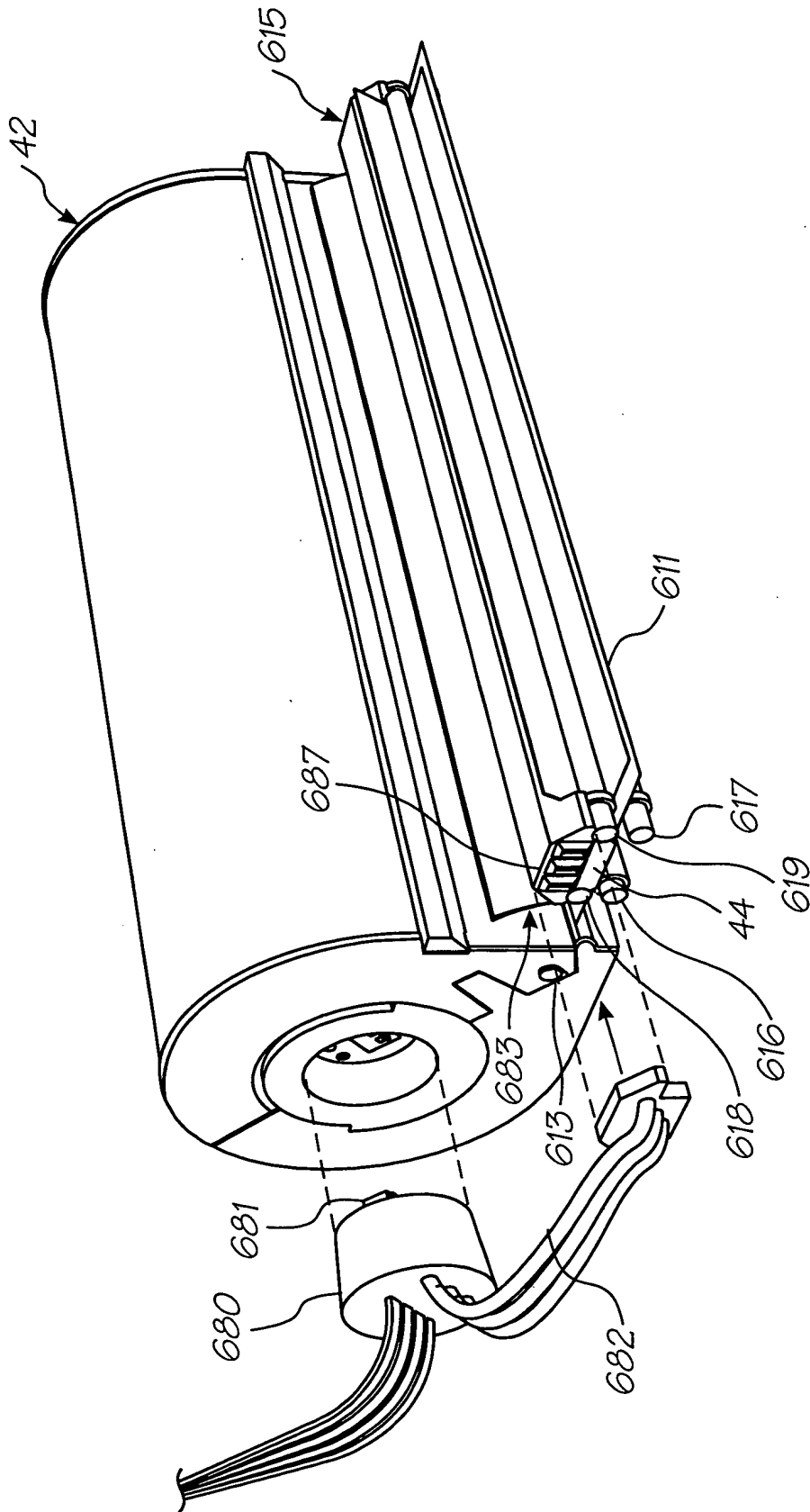


FIG. 162

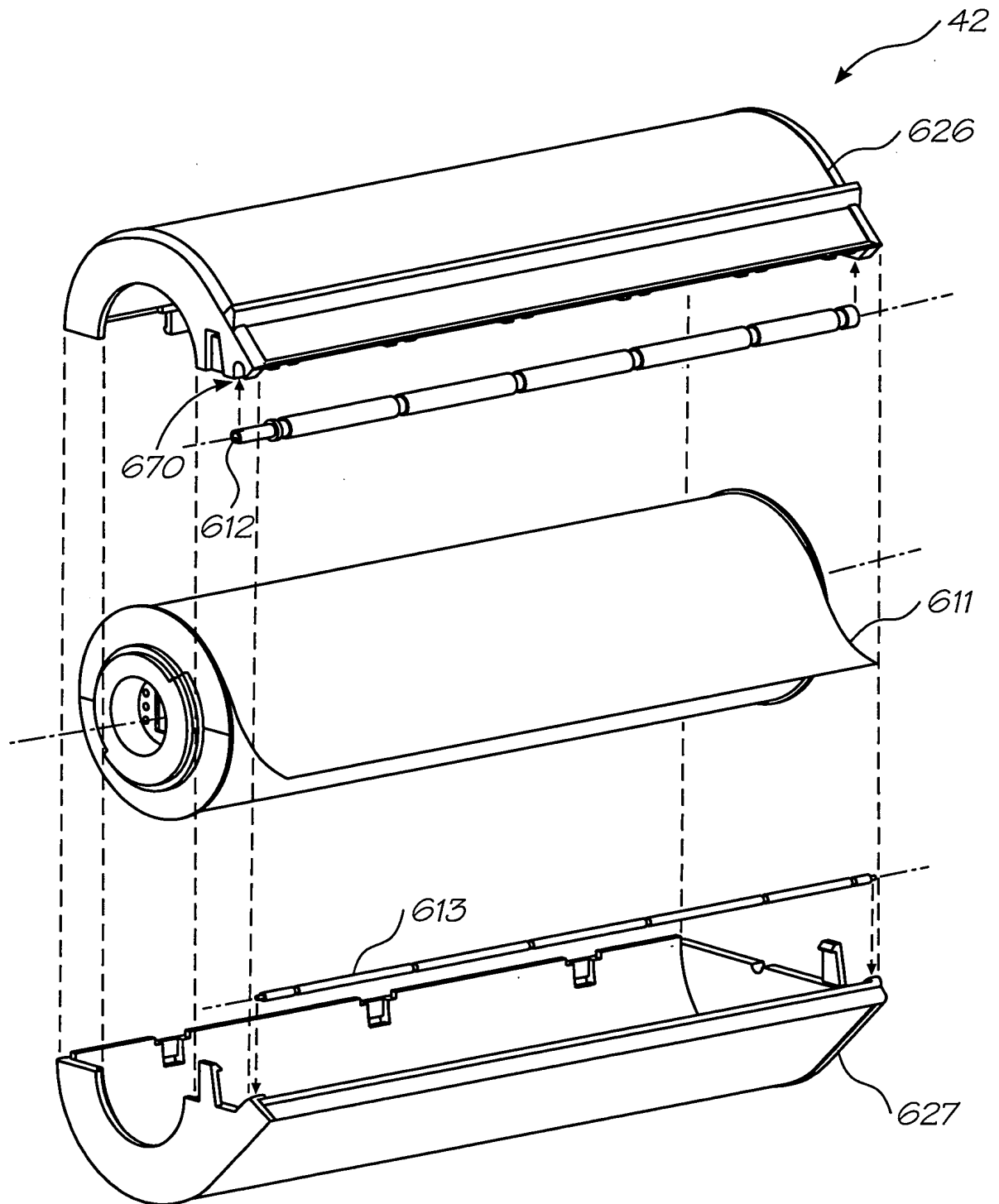


FIG. 163

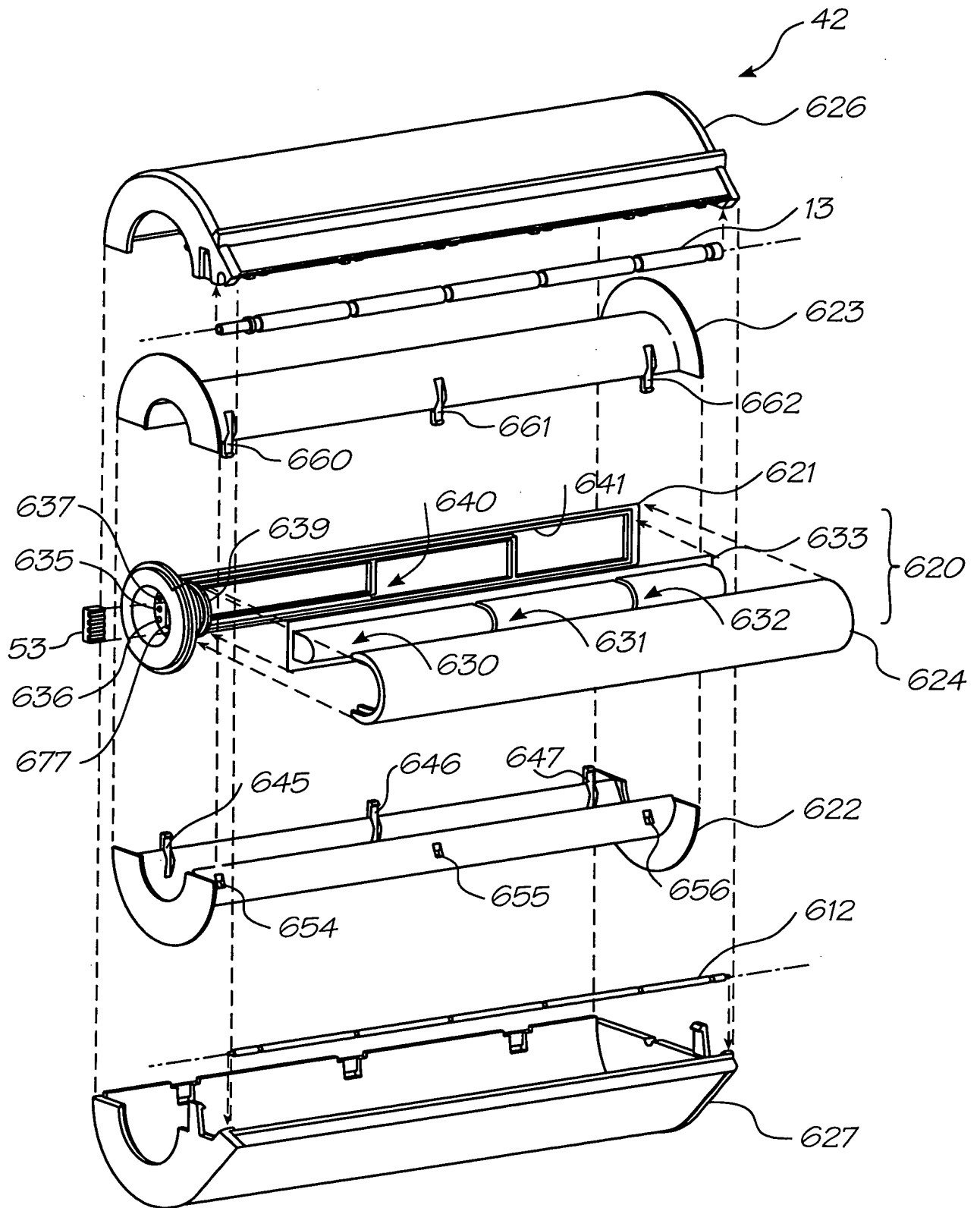


FIG. 164

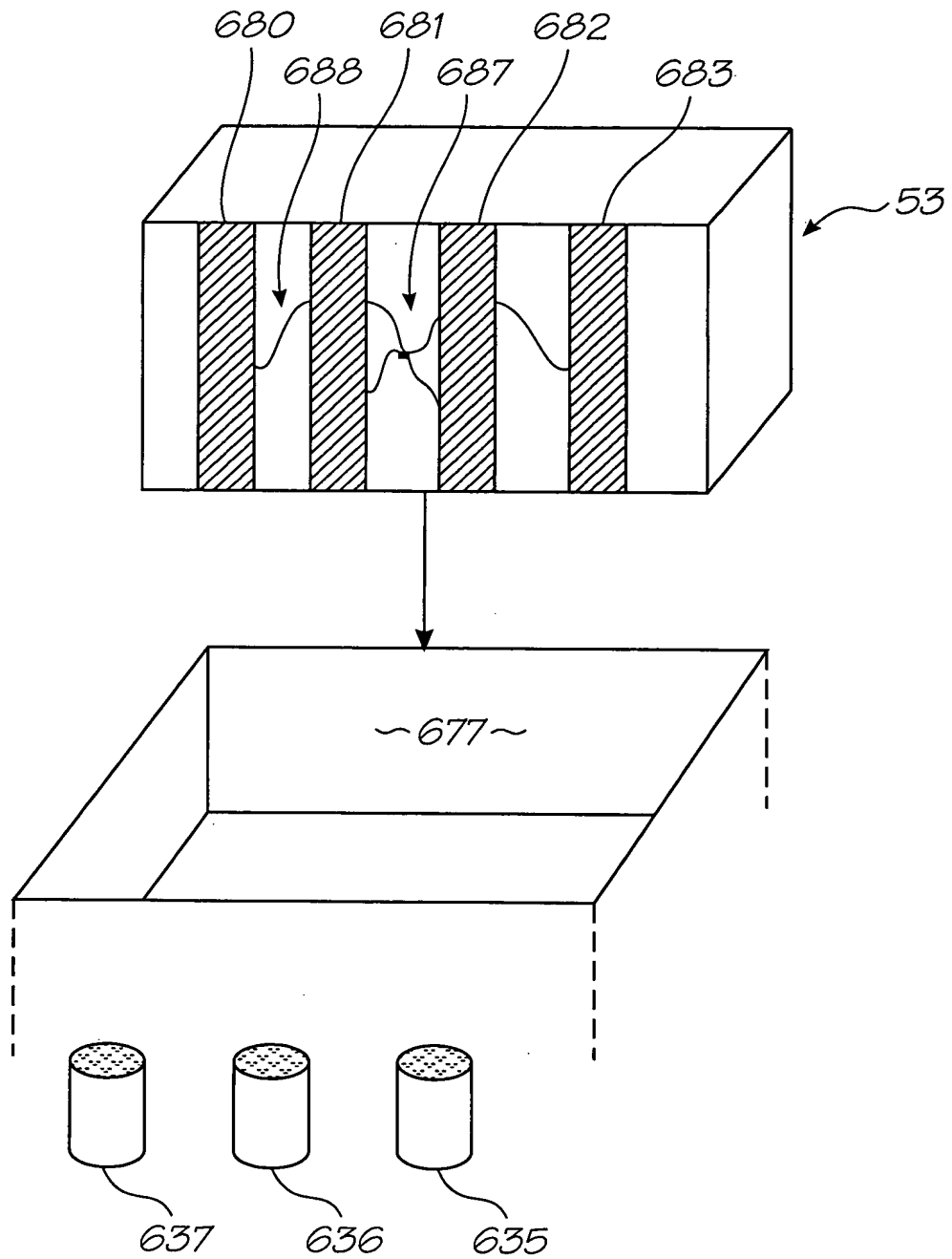


FIG. 165

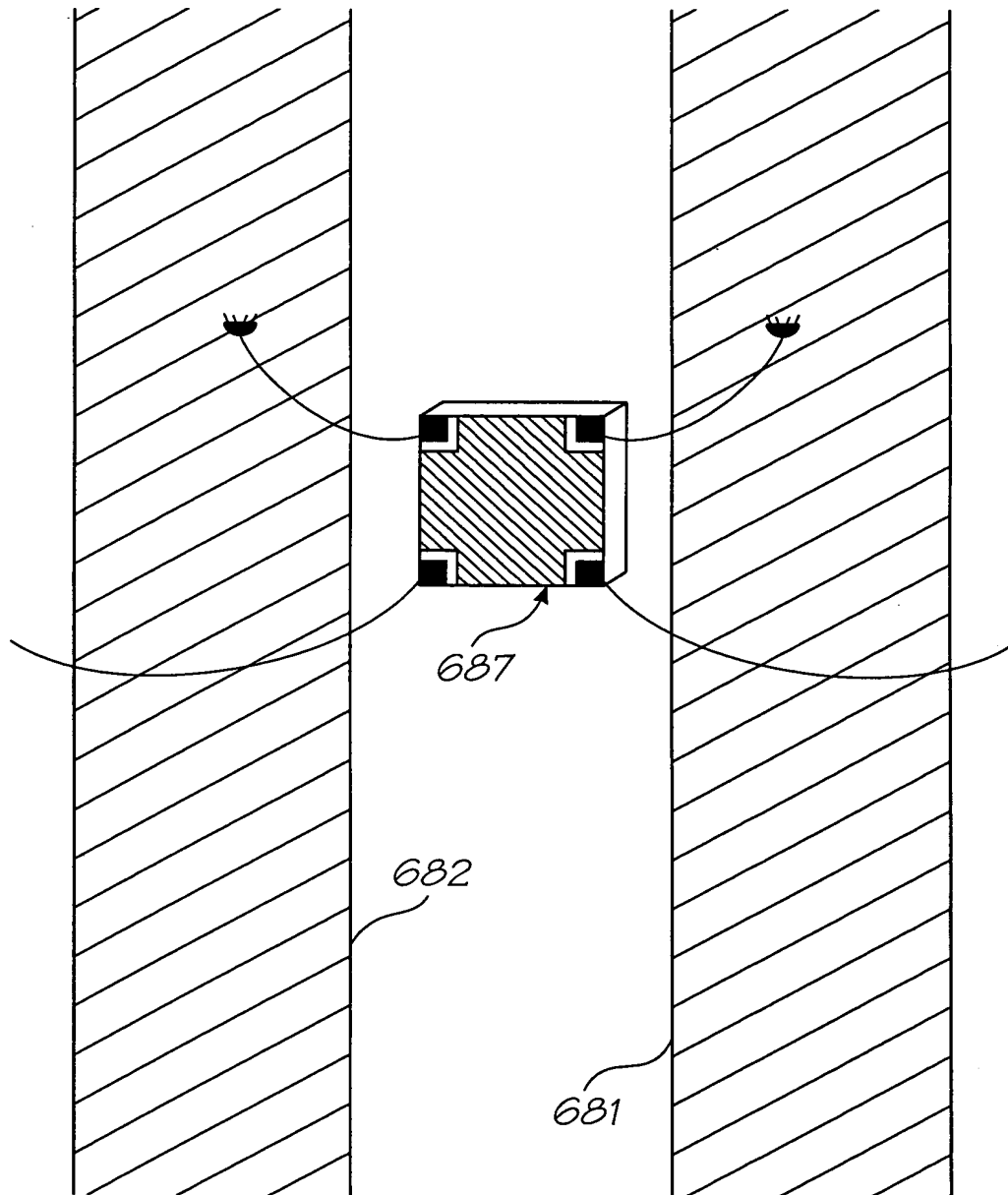


FIG. 166

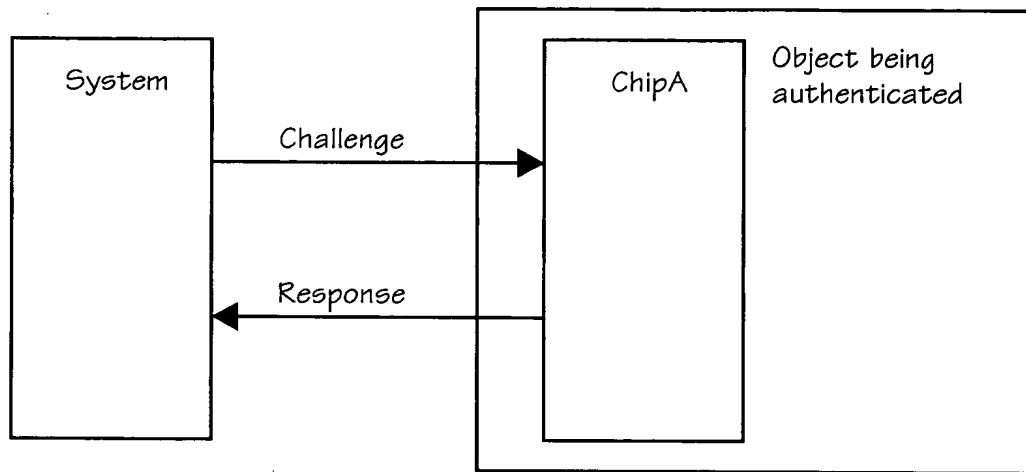


FIG. 167

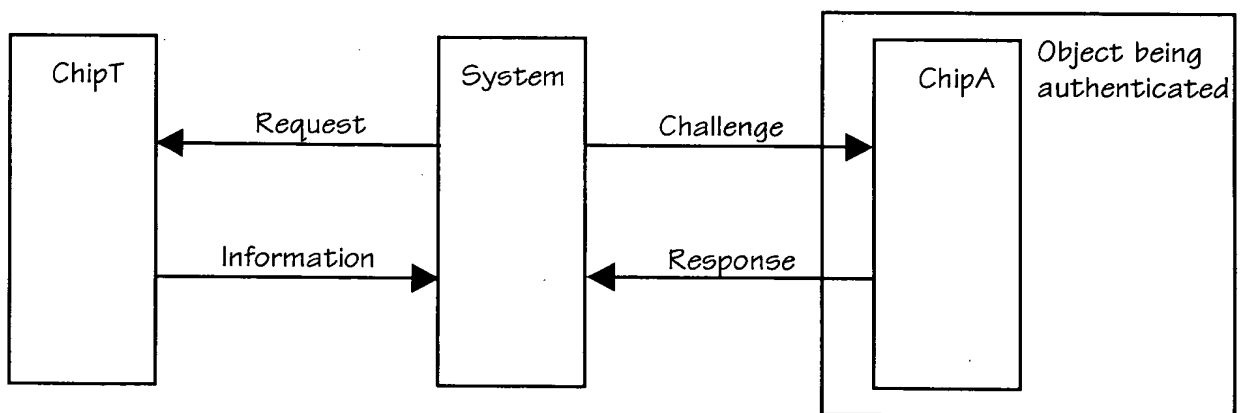


FIG. 168

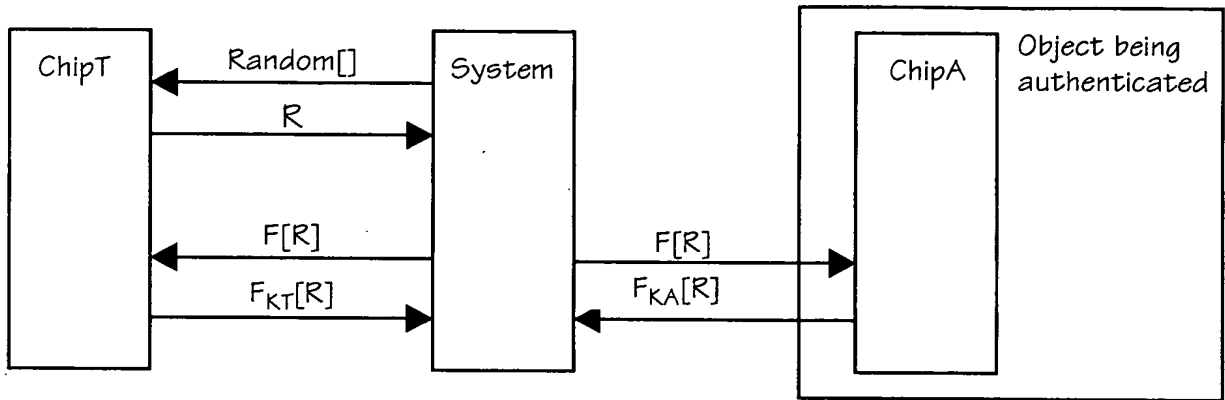


FIG. 169

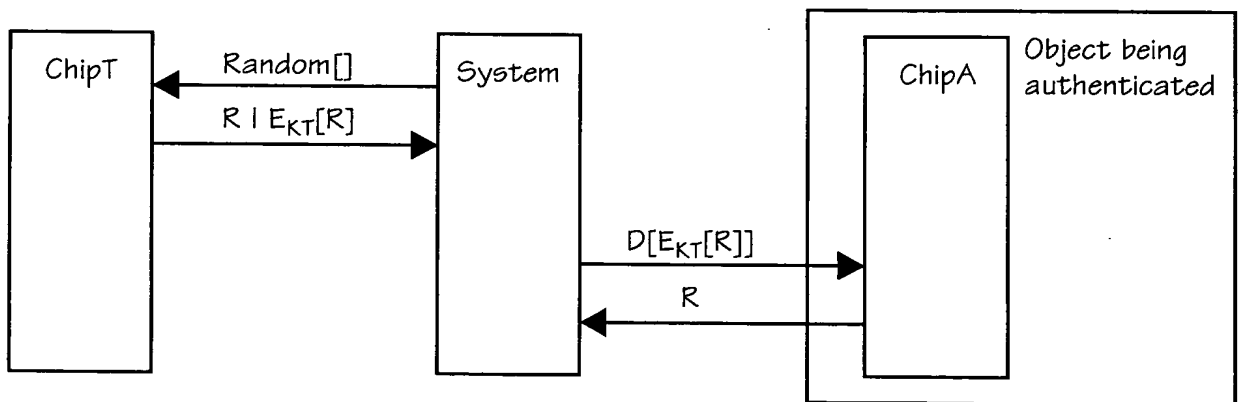


FIG. 170

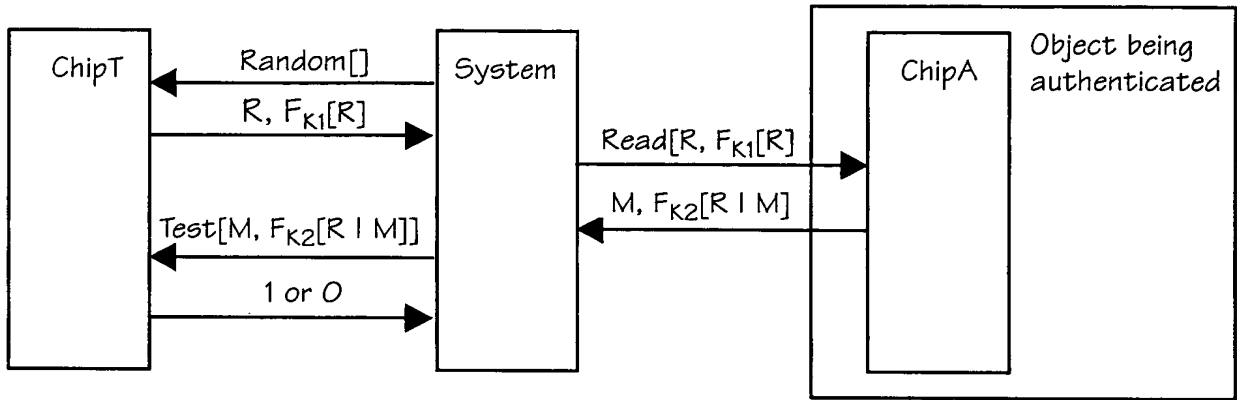


FIG. 171

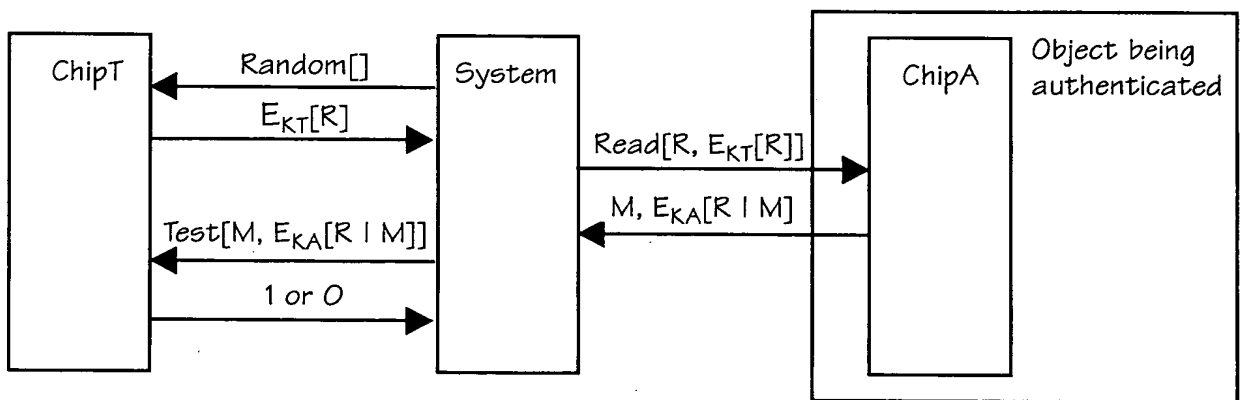


FIG. 172

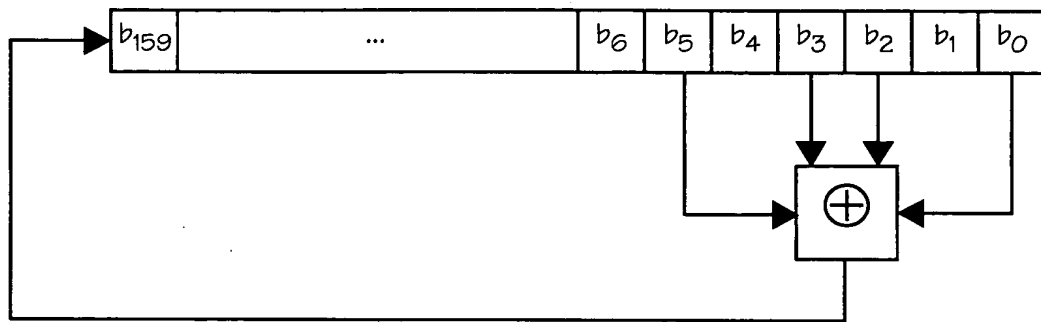


FIG. 173

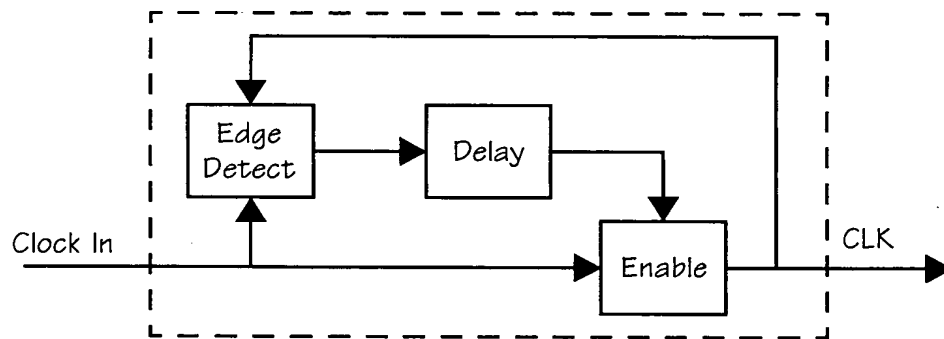


FIG. 174

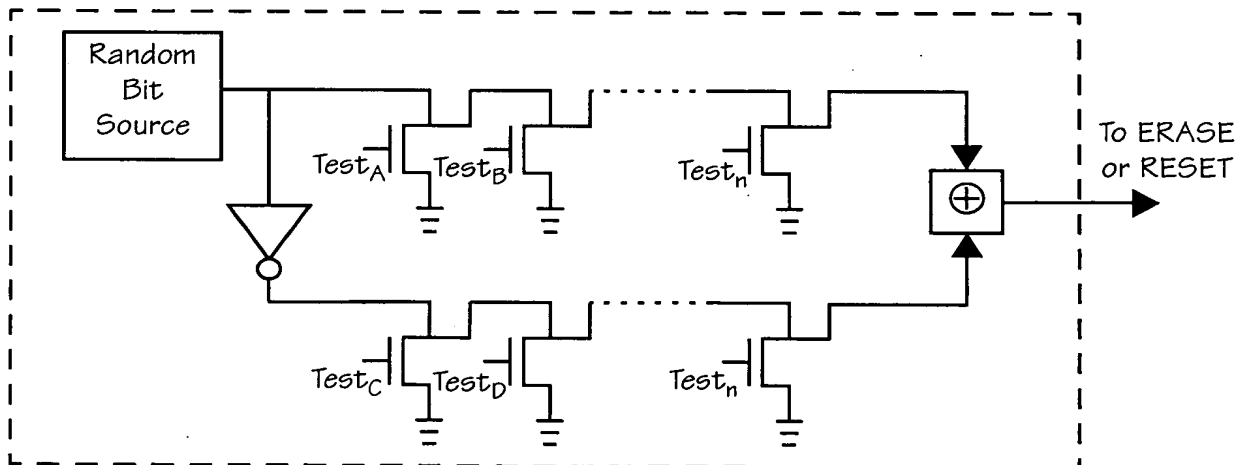


FIG. 175

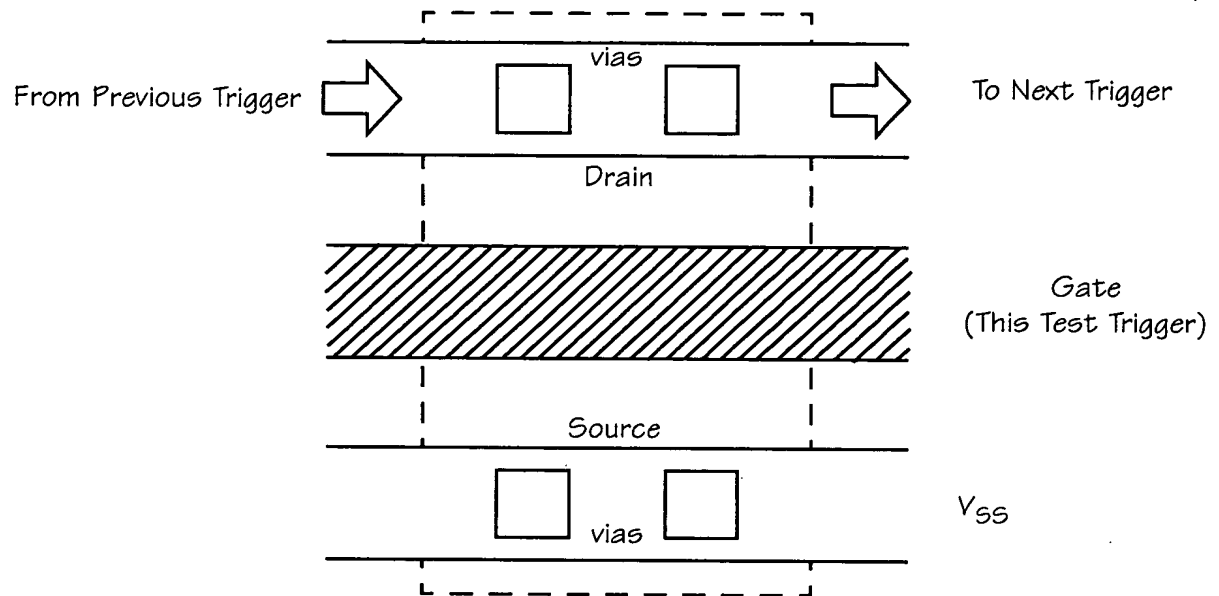


FIG. 176

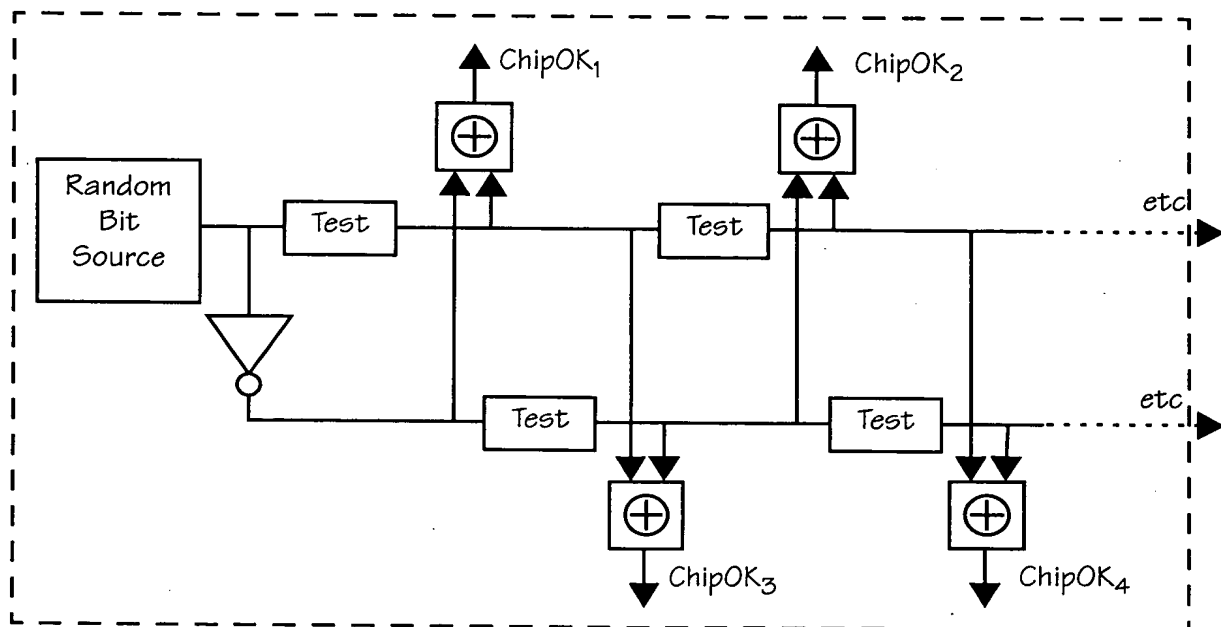


FIG. 177

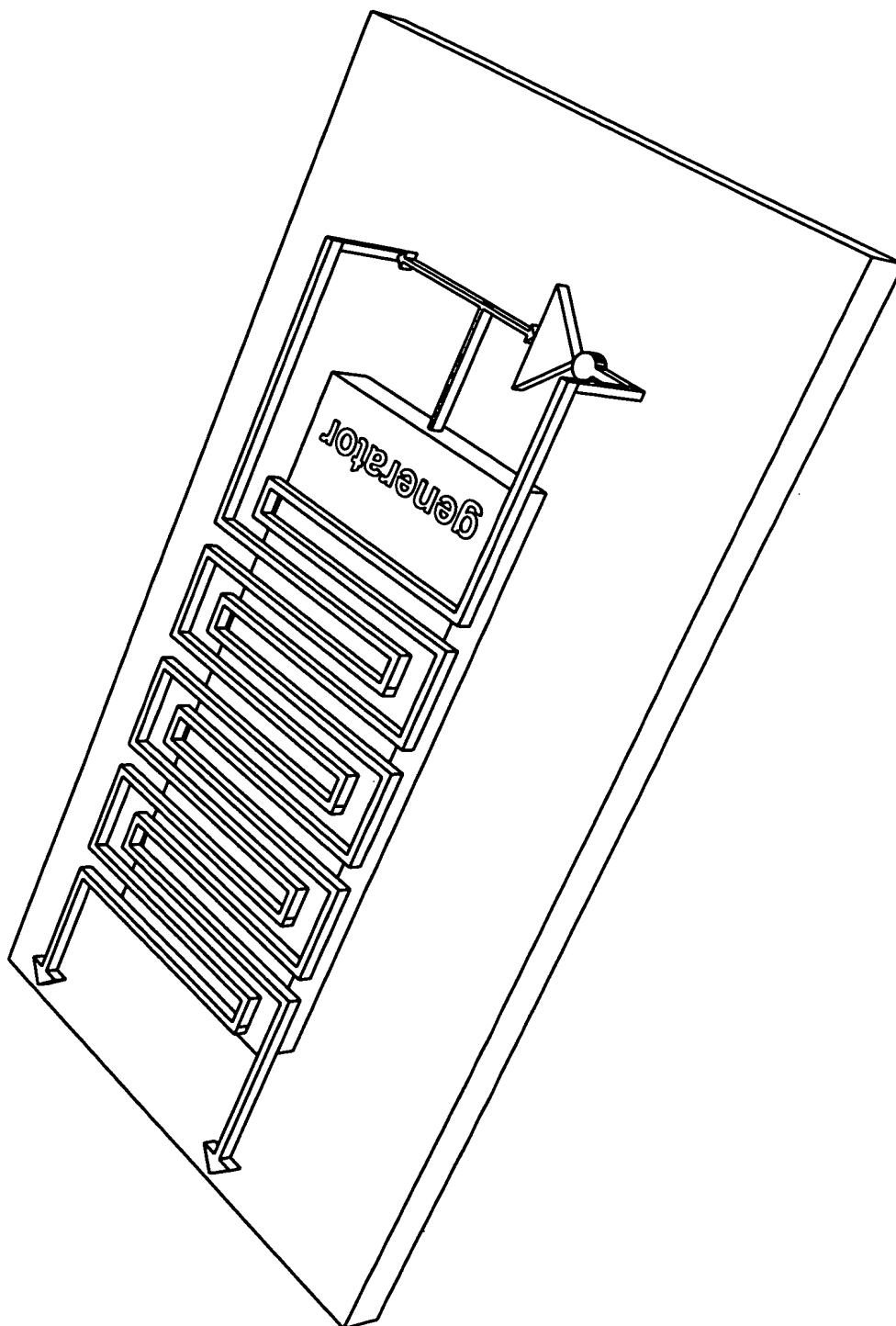


FIG. 178

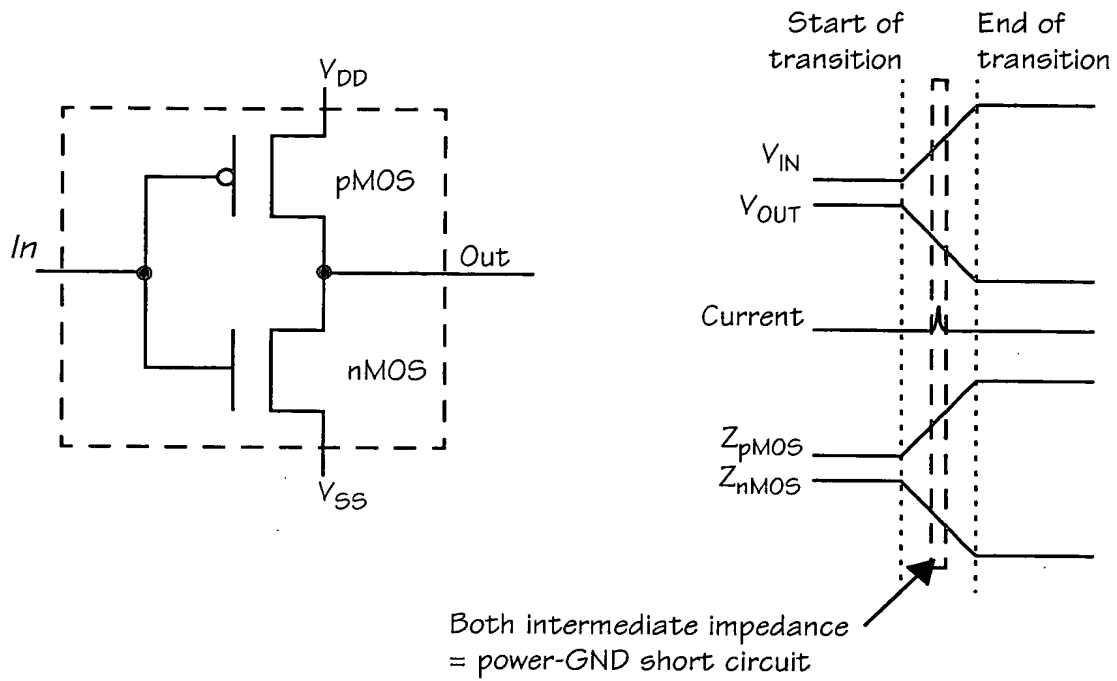


FIG. 179

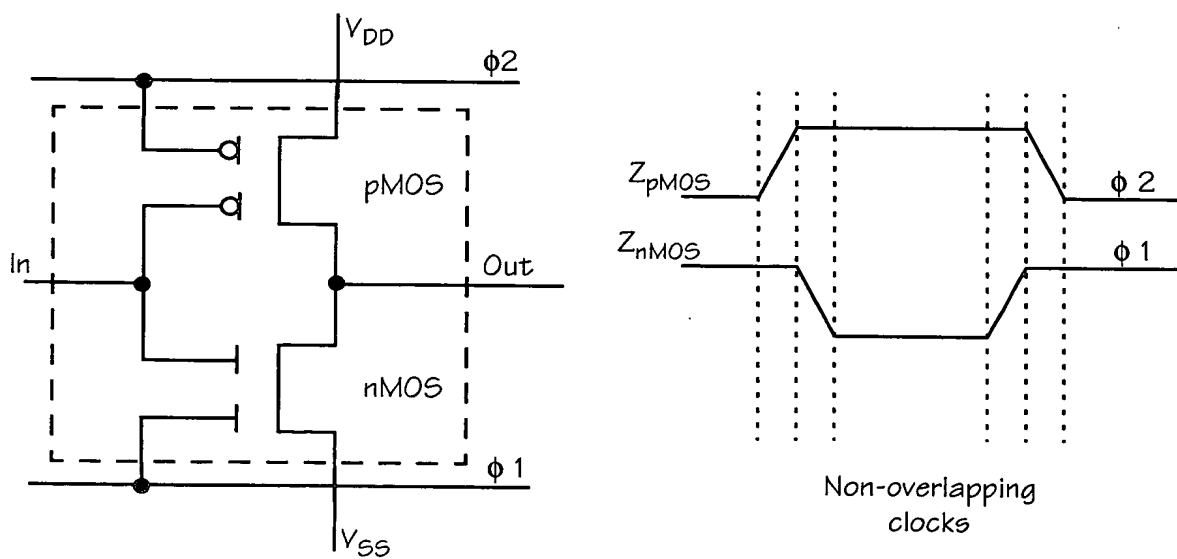


FIG. 180

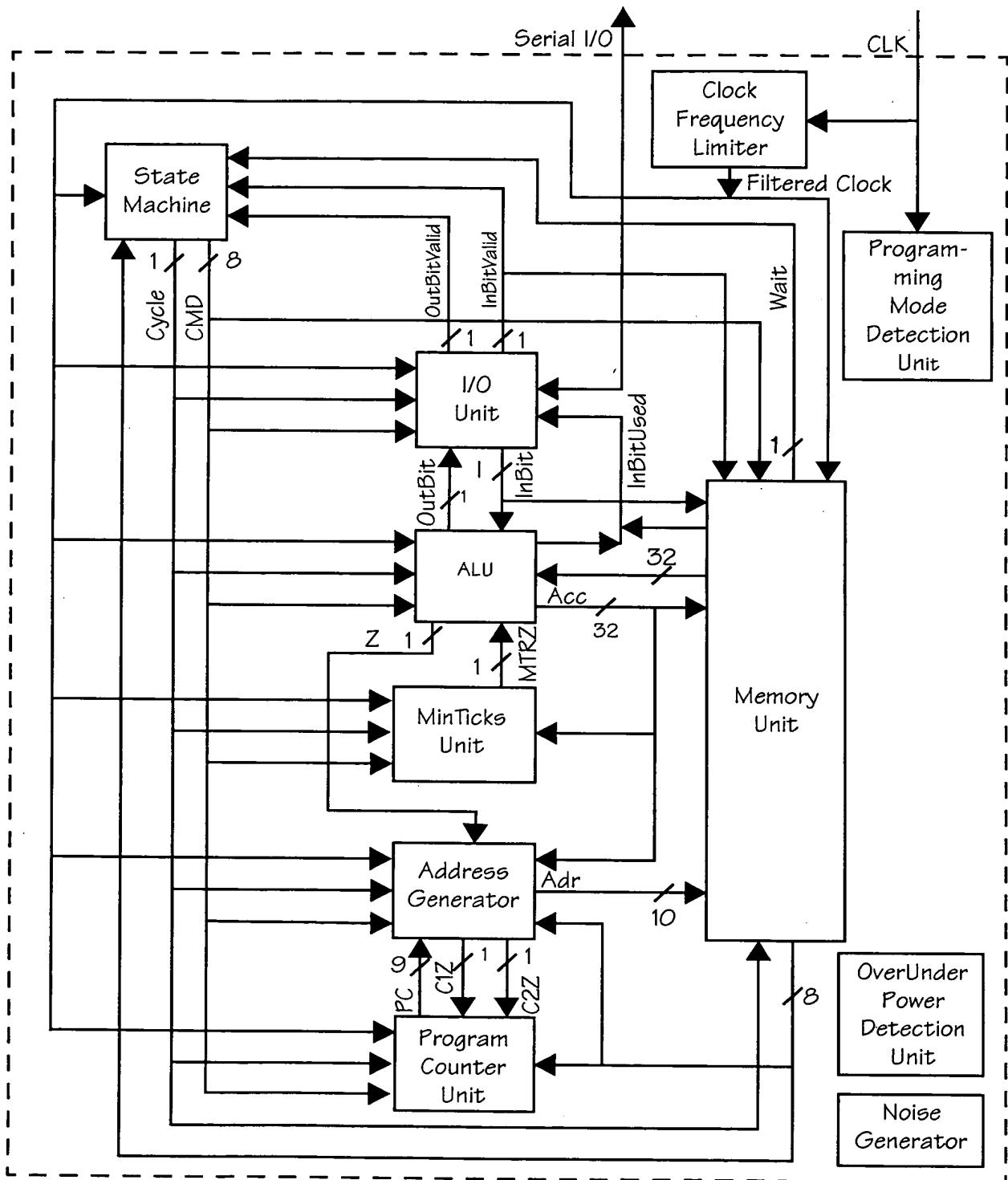


FIG. 181

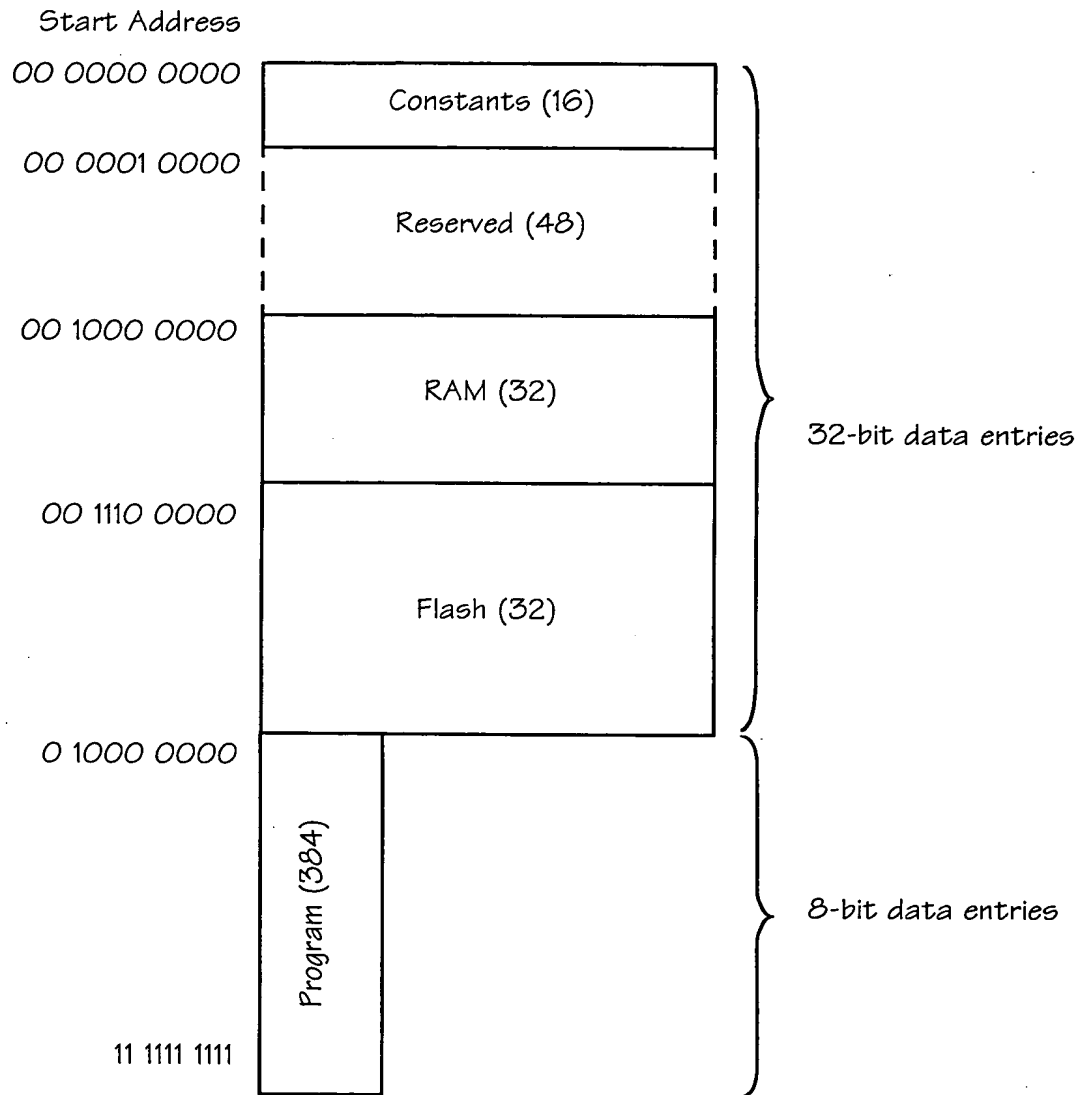


FIG. 182

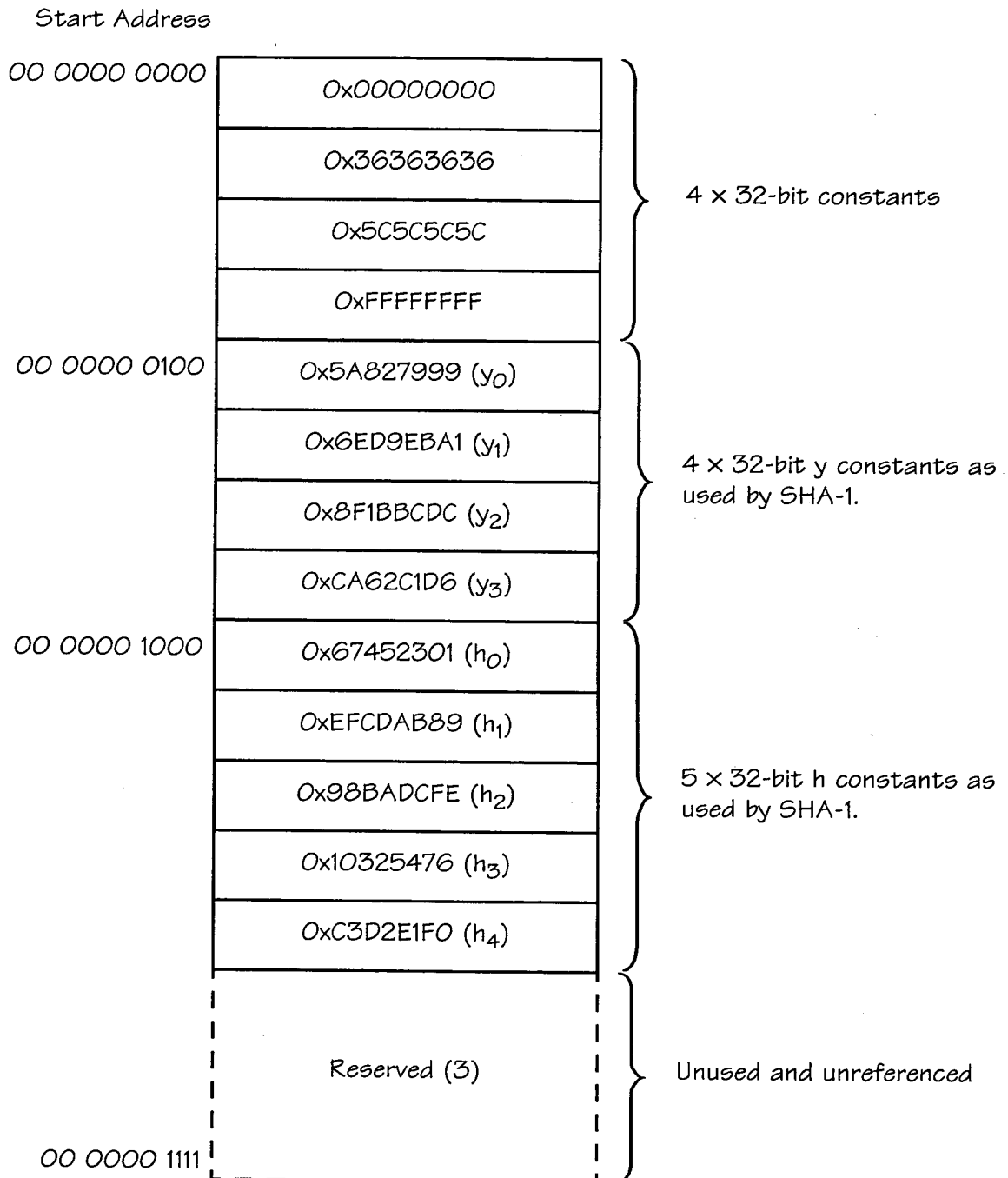


FIG. 183

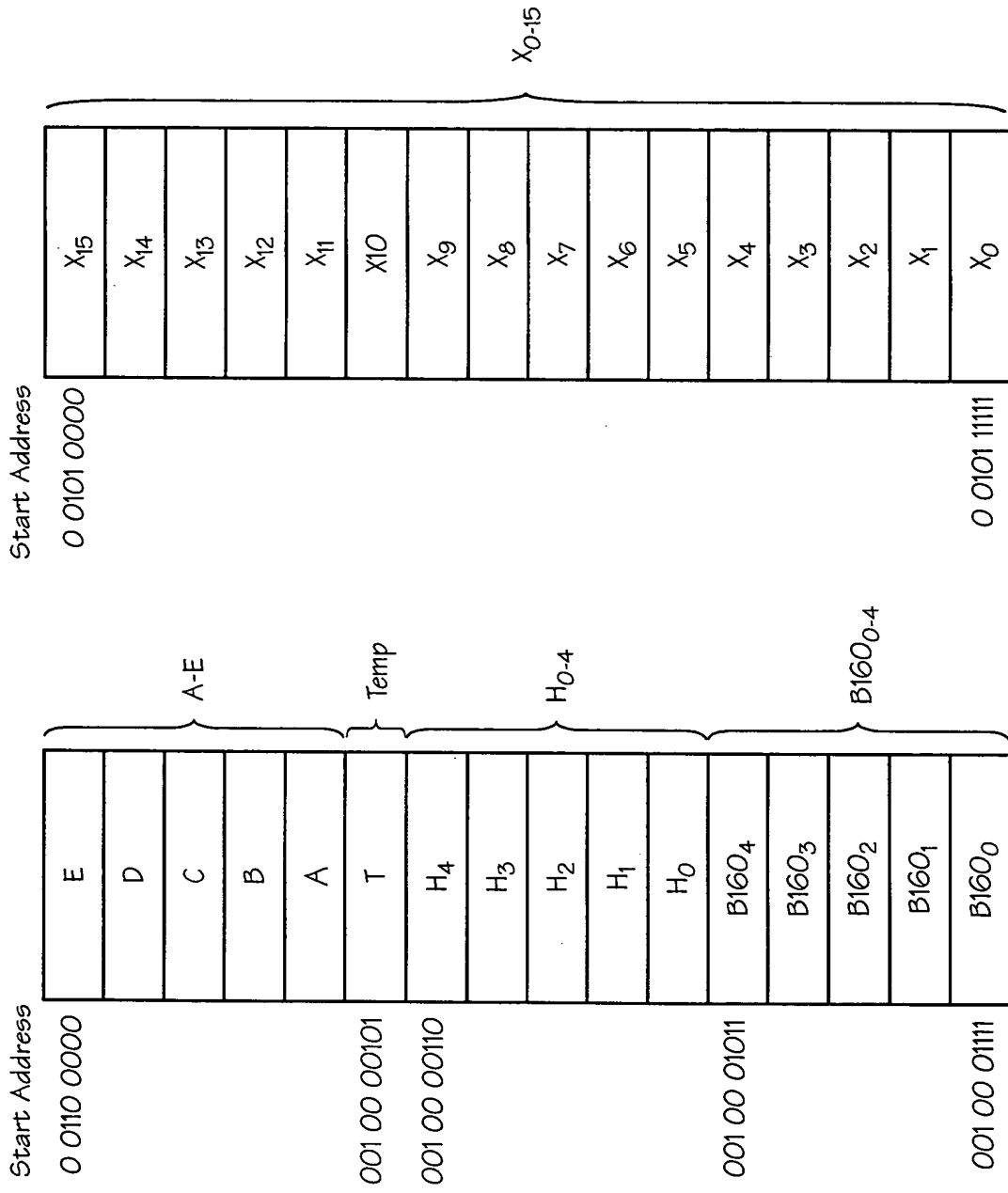


FIG. 184

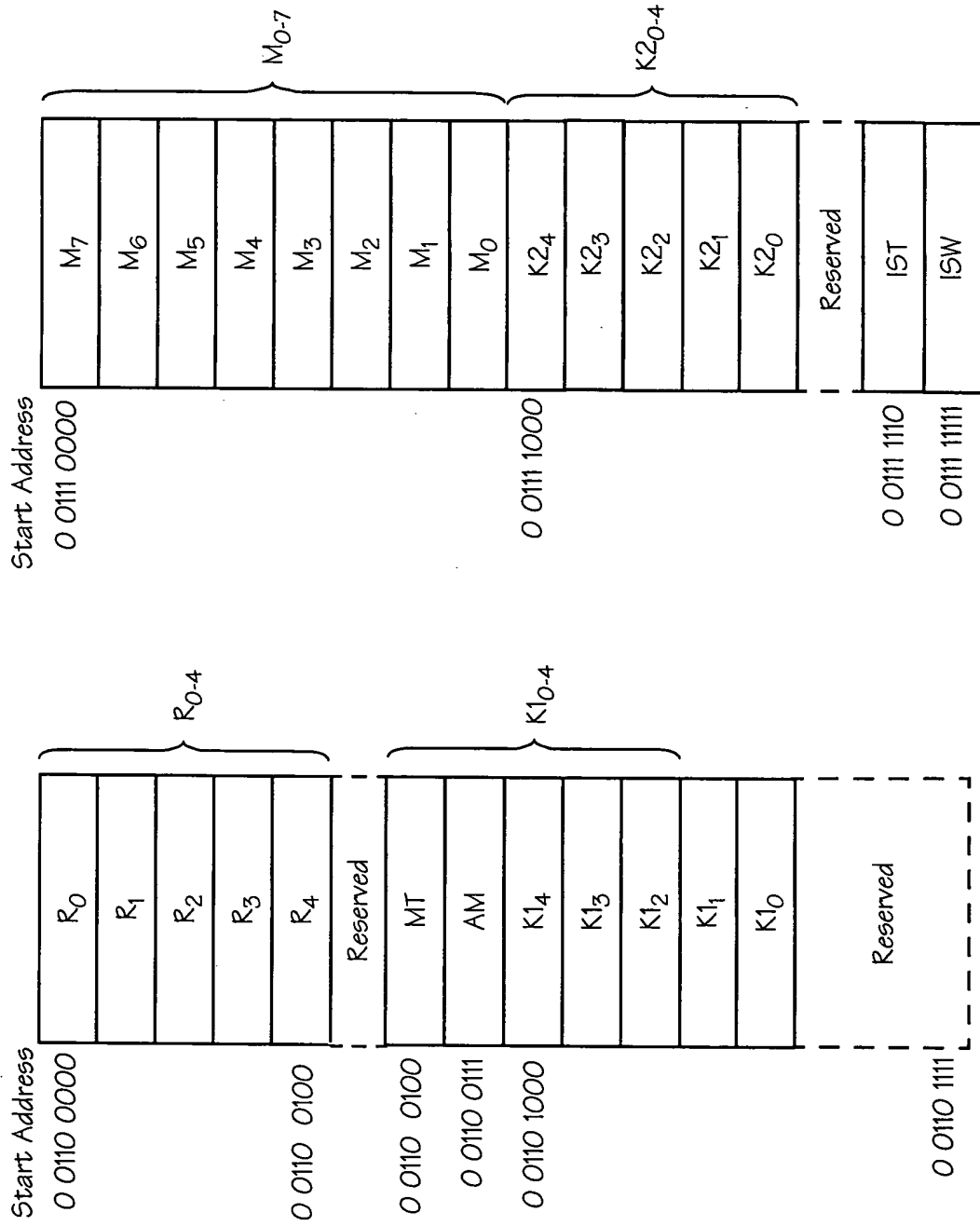


FIG. 185

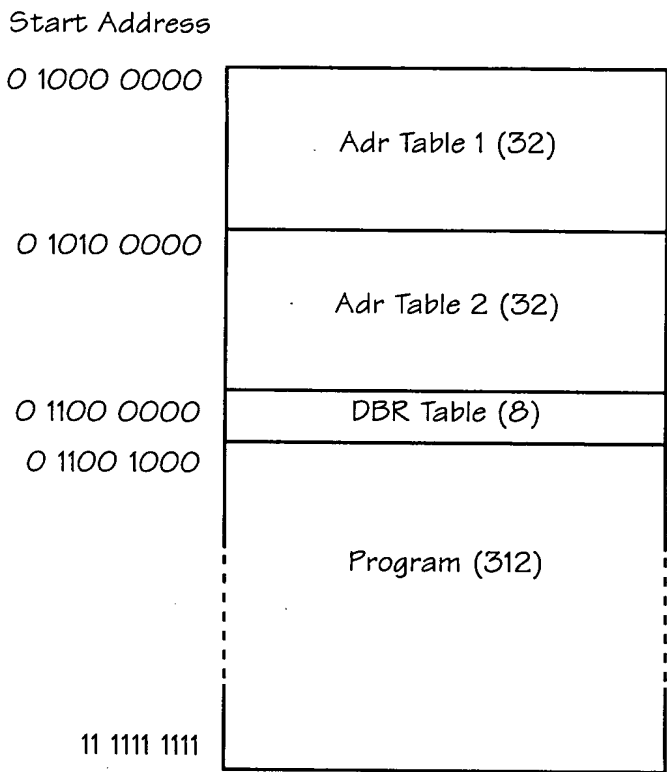


FIG. 186

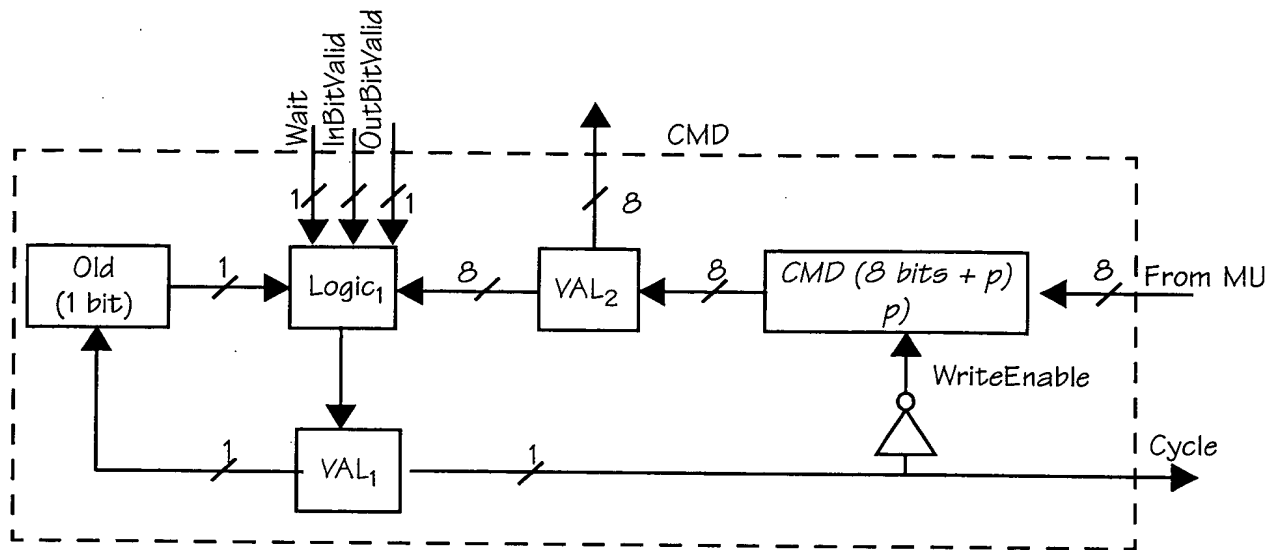


FIG. 187

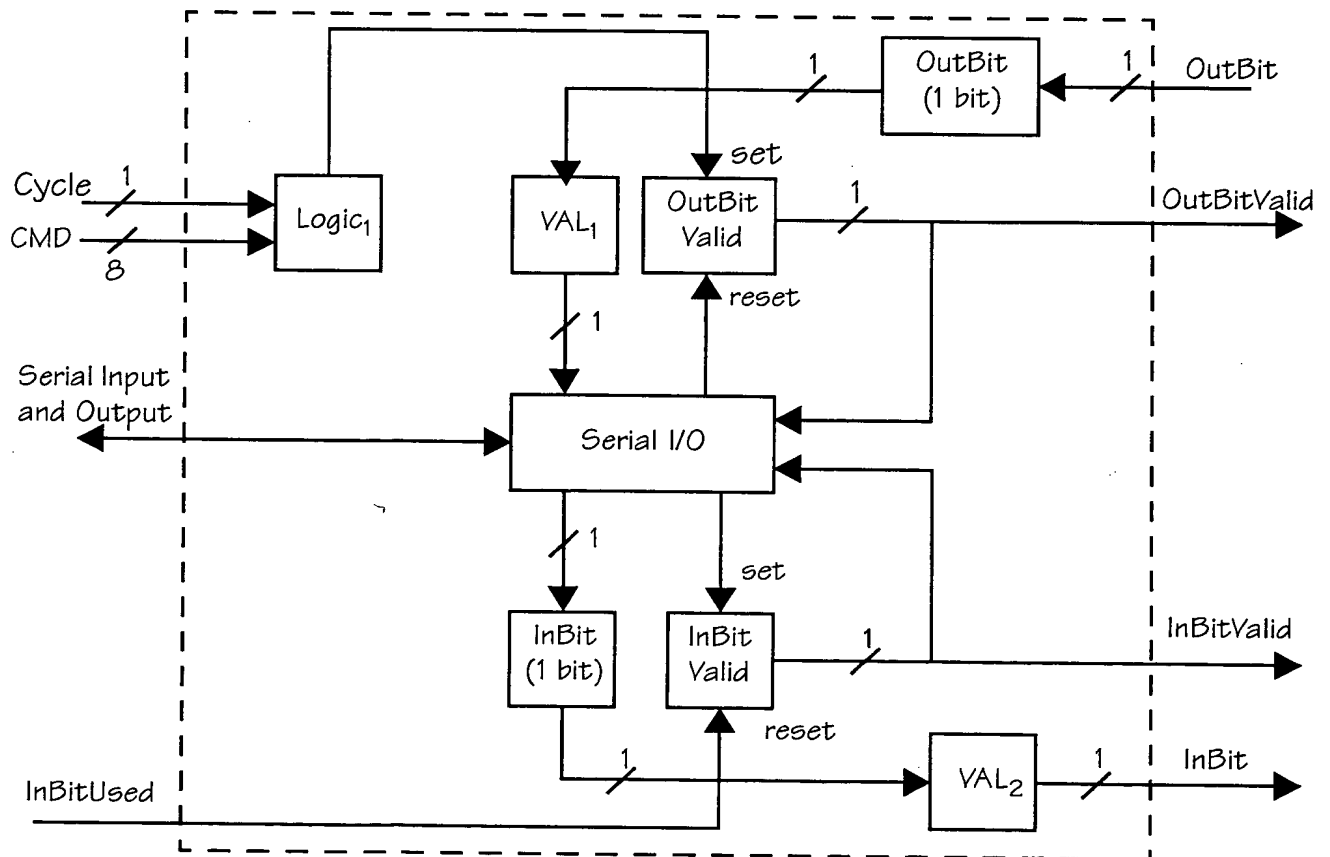


FIG. 188

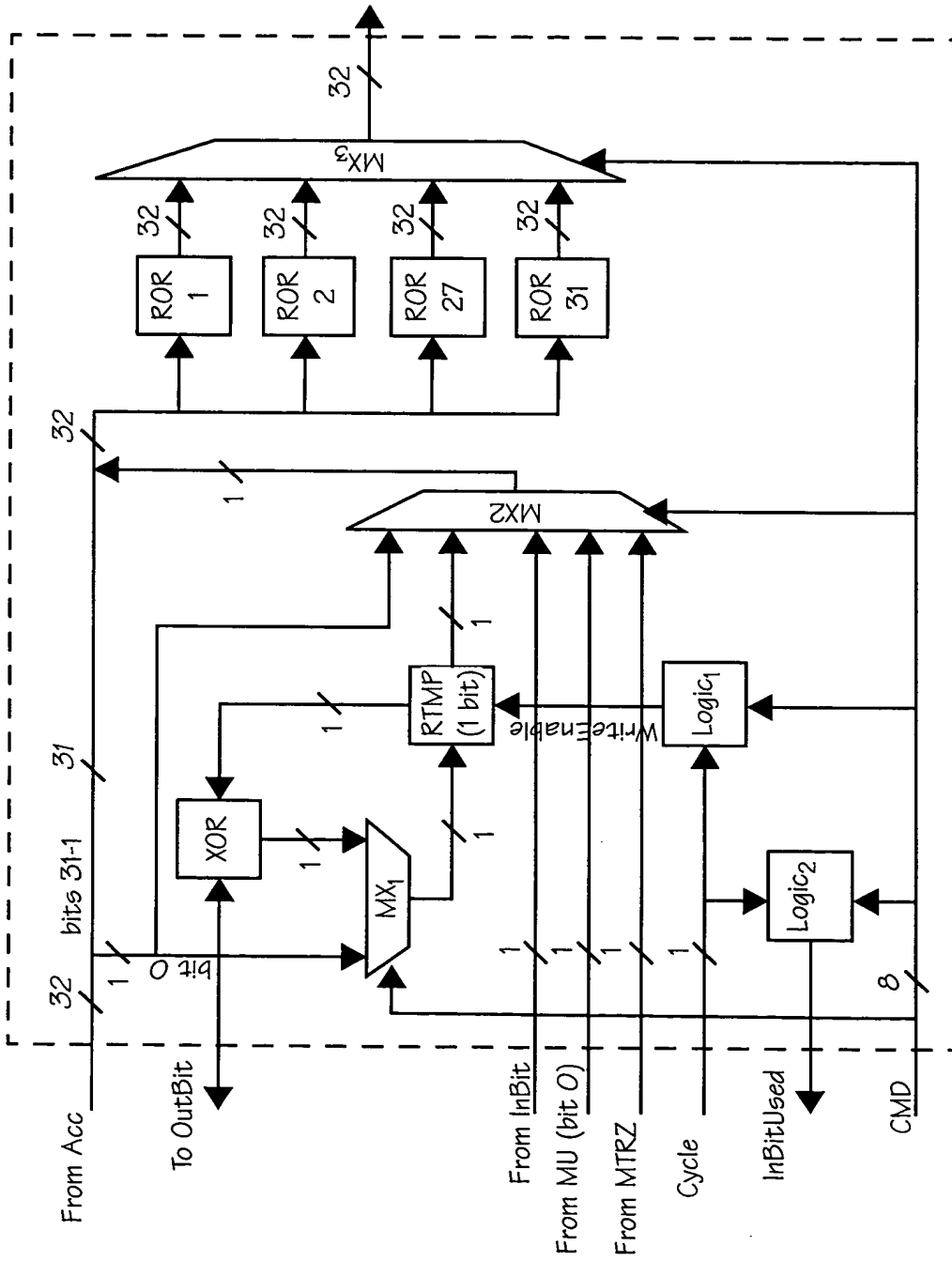


FIG. 190

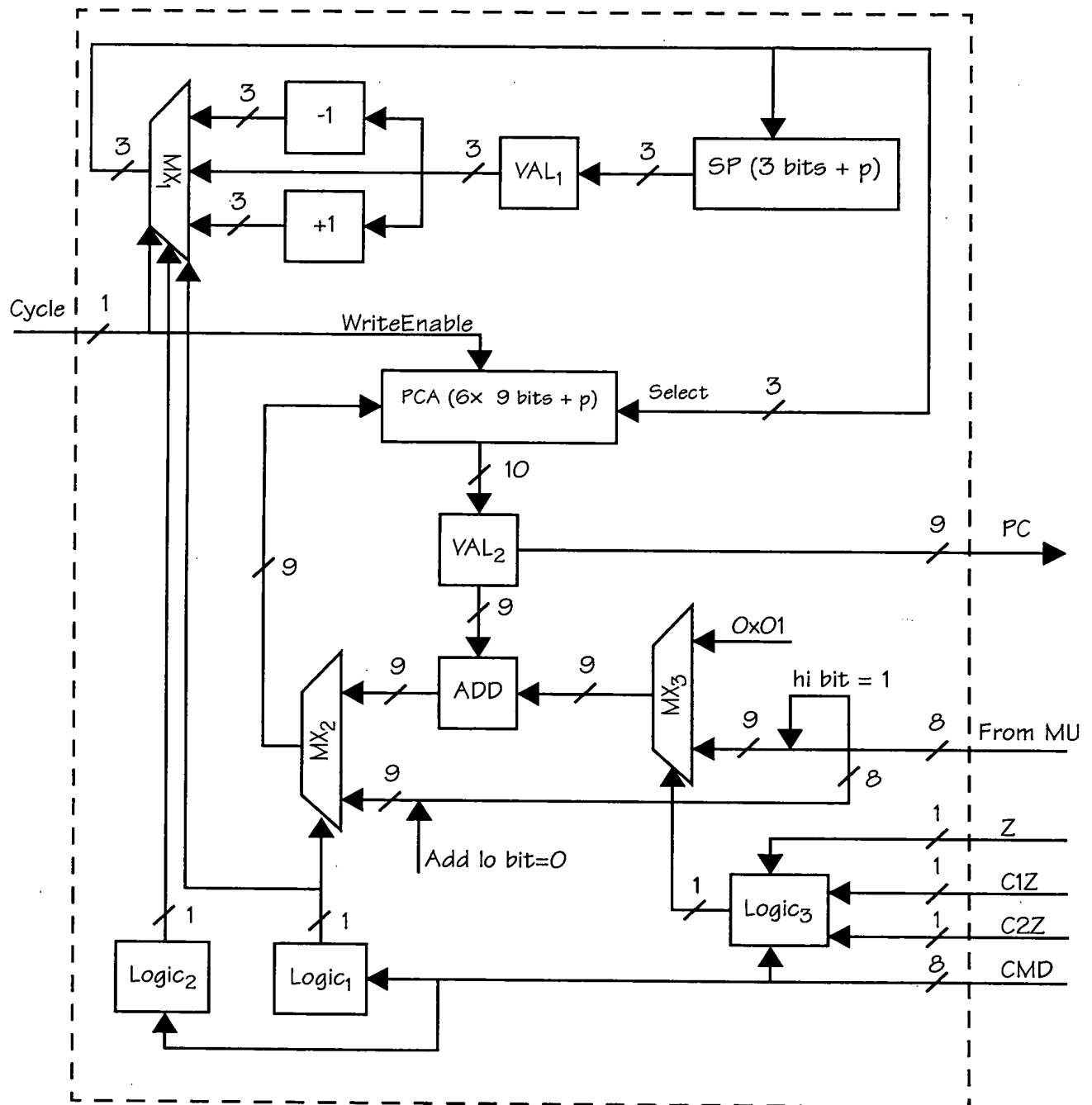


FIG. 192

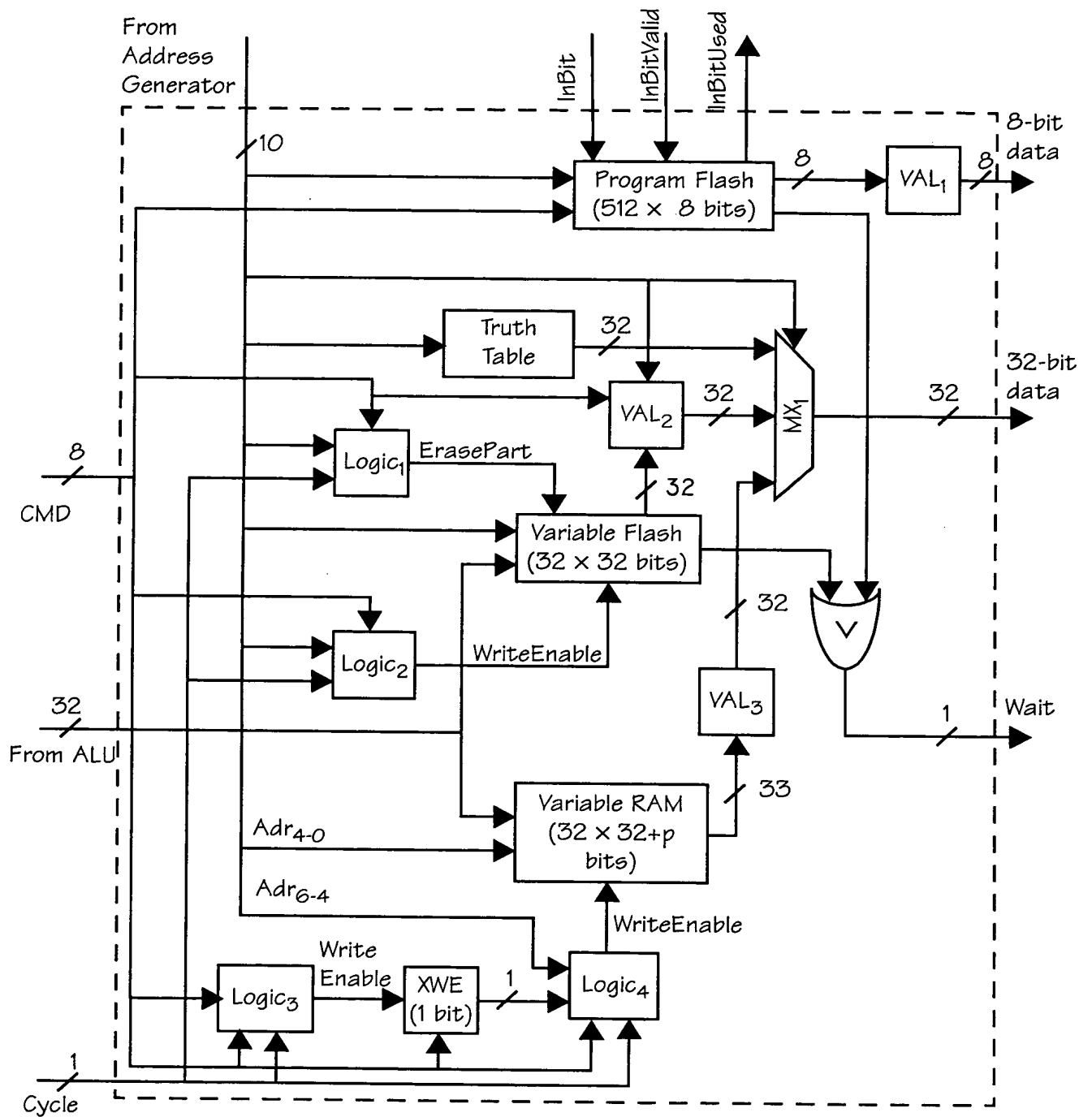


FIG. 193

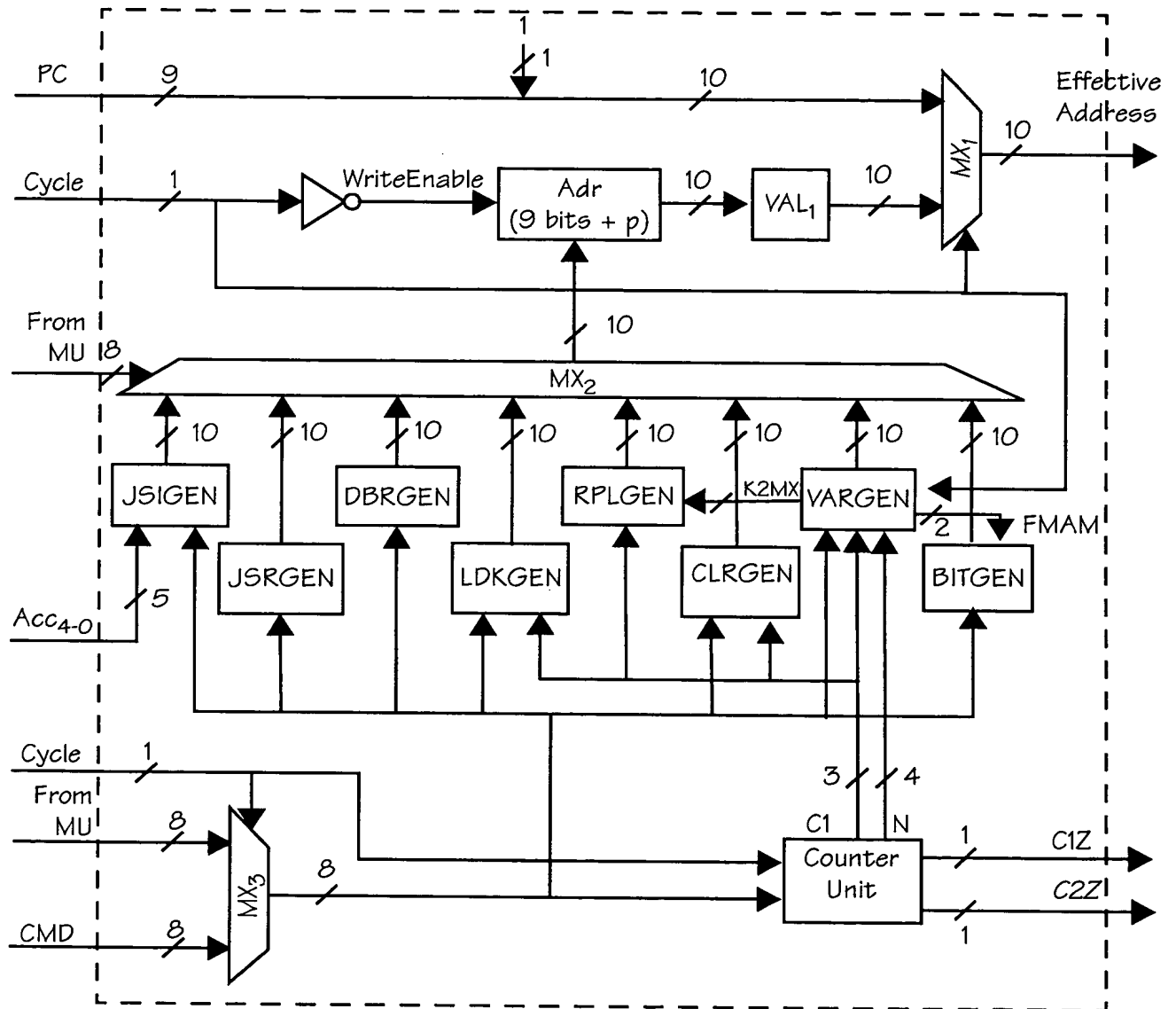


FIG. 194

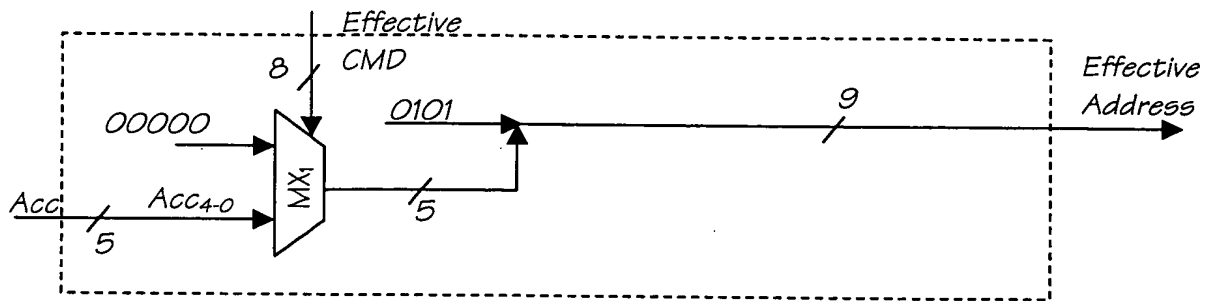


FIG. 195

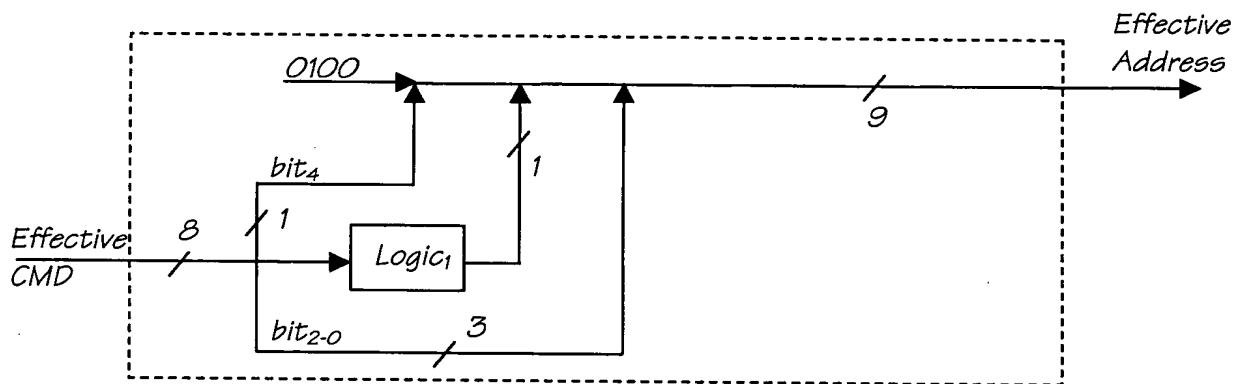


FIG. 196

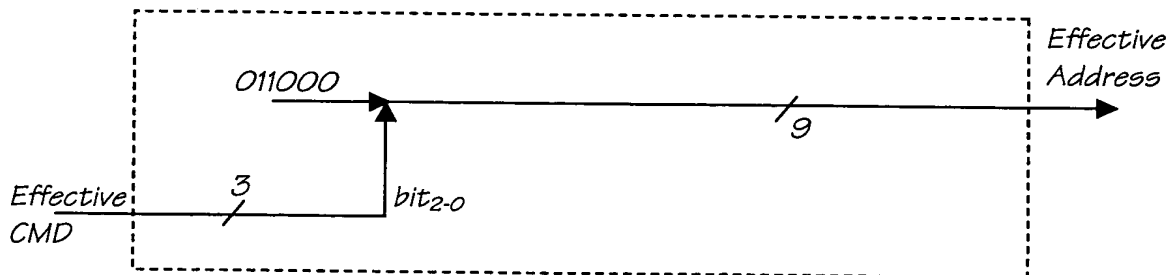


FIG. 197

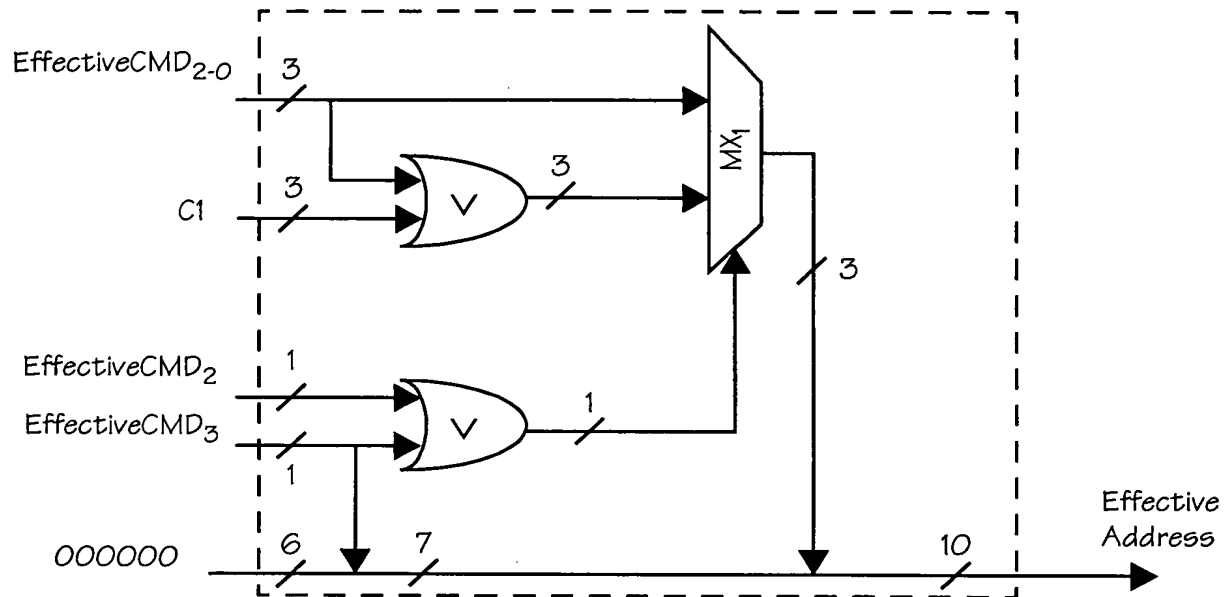


FIG. 198

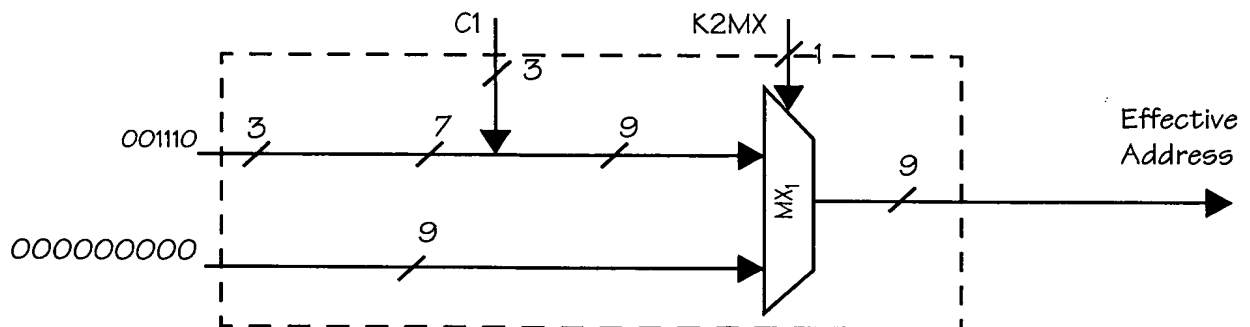


FIG. 199

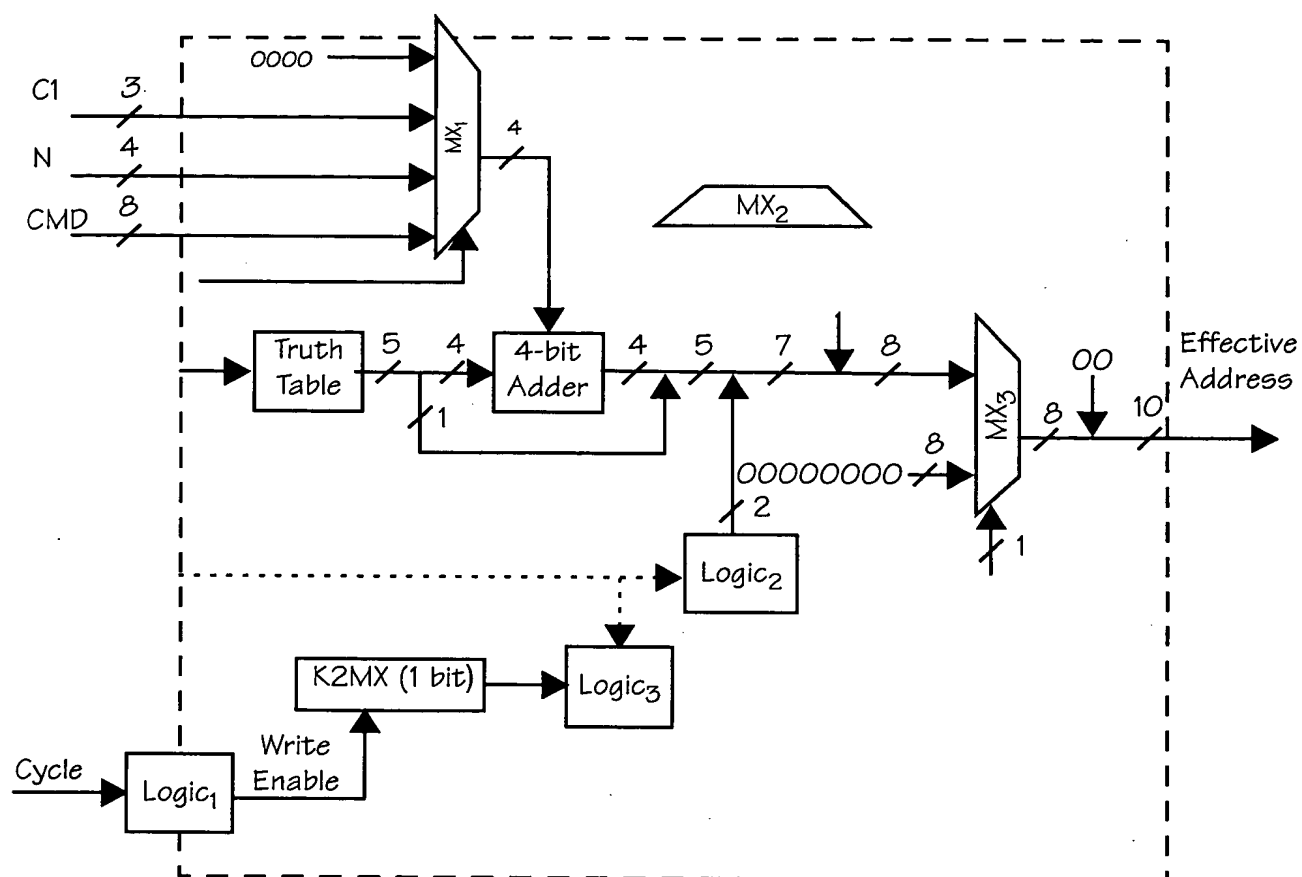


FIG. 200

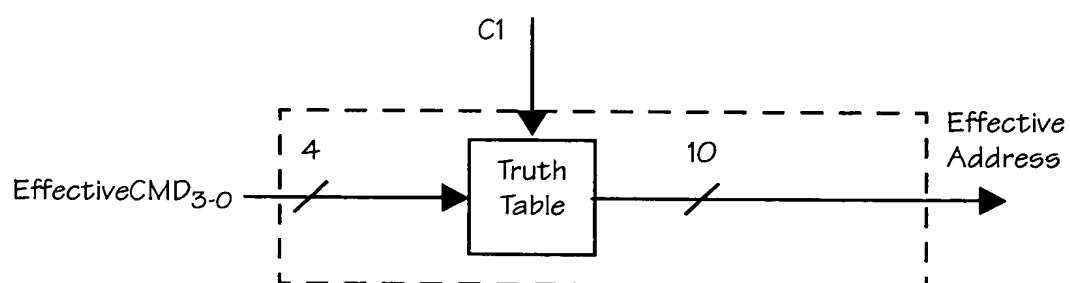


FIG. 201

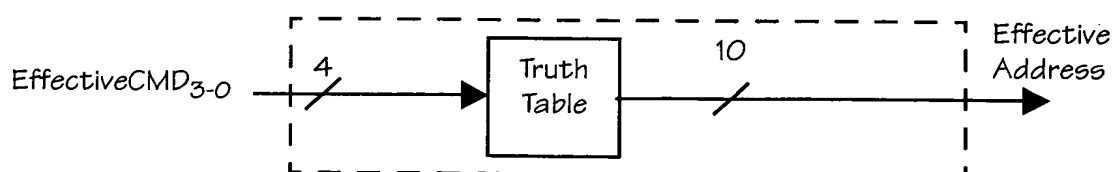


FIG. 202

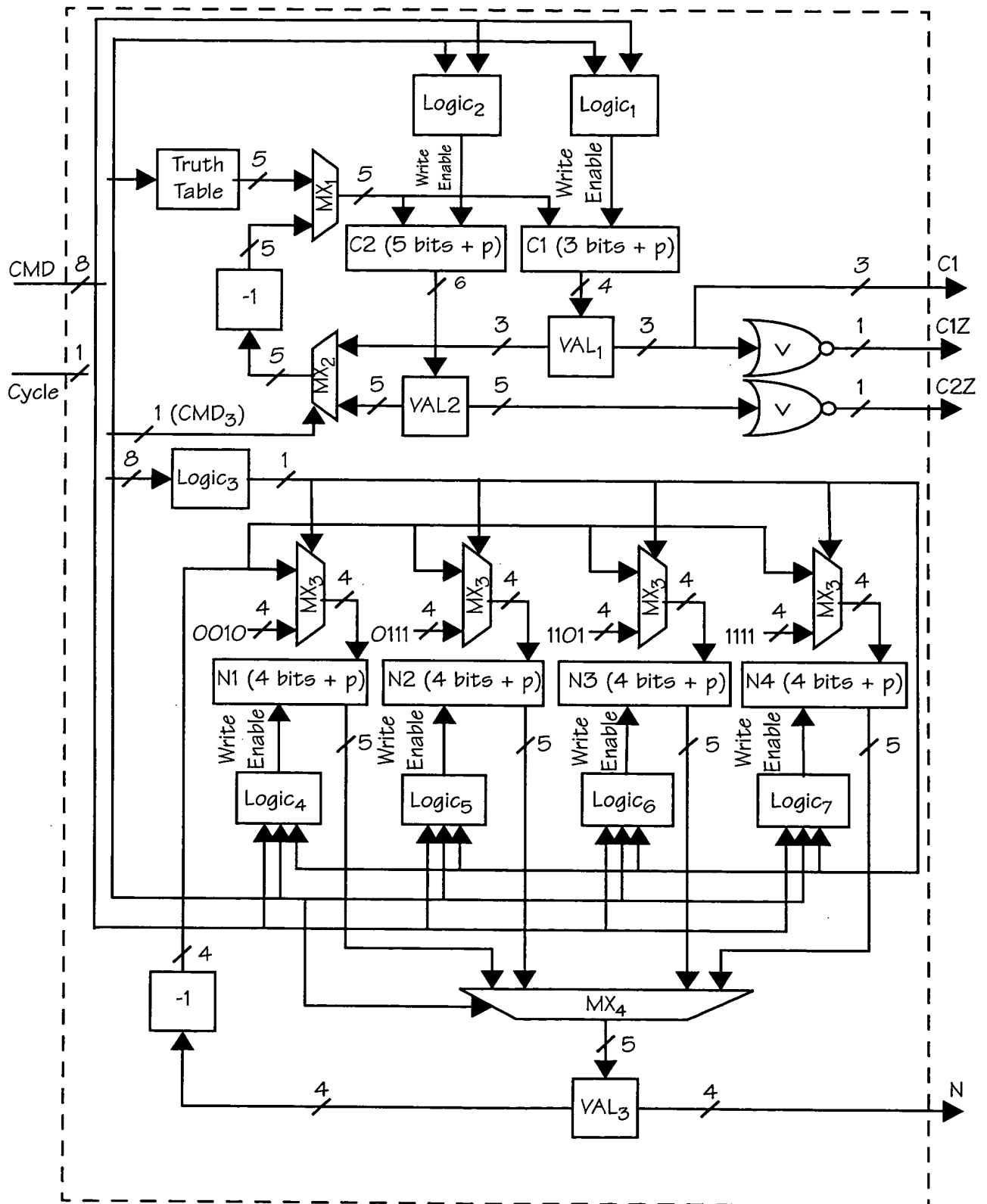


FIG. 203

705

DATA TYPE	BITS
Factory Code	16
Batch Number	32
Serial Number	48
Manufacturing Date	16
Media Length	24
Media Type	8
Preprinted Media Length	16
Cyan Ink Viscosity	8
Magenta Ink Viscosity	8
Yellow Ink Viscosity	8
Cyan Drop Volume	8
Magenta Drop Volume	8
Yellow Drop Volume	8
Cyan Ink Color	24
Magenta Ink Color	24
Yellow Ink Color	24
Remaining-media Length Indicator	16
Authentication Key	128
Copyrightable bit pattern	512
Reserved for Camera Use	88
Total	1024

728

FIG. 204

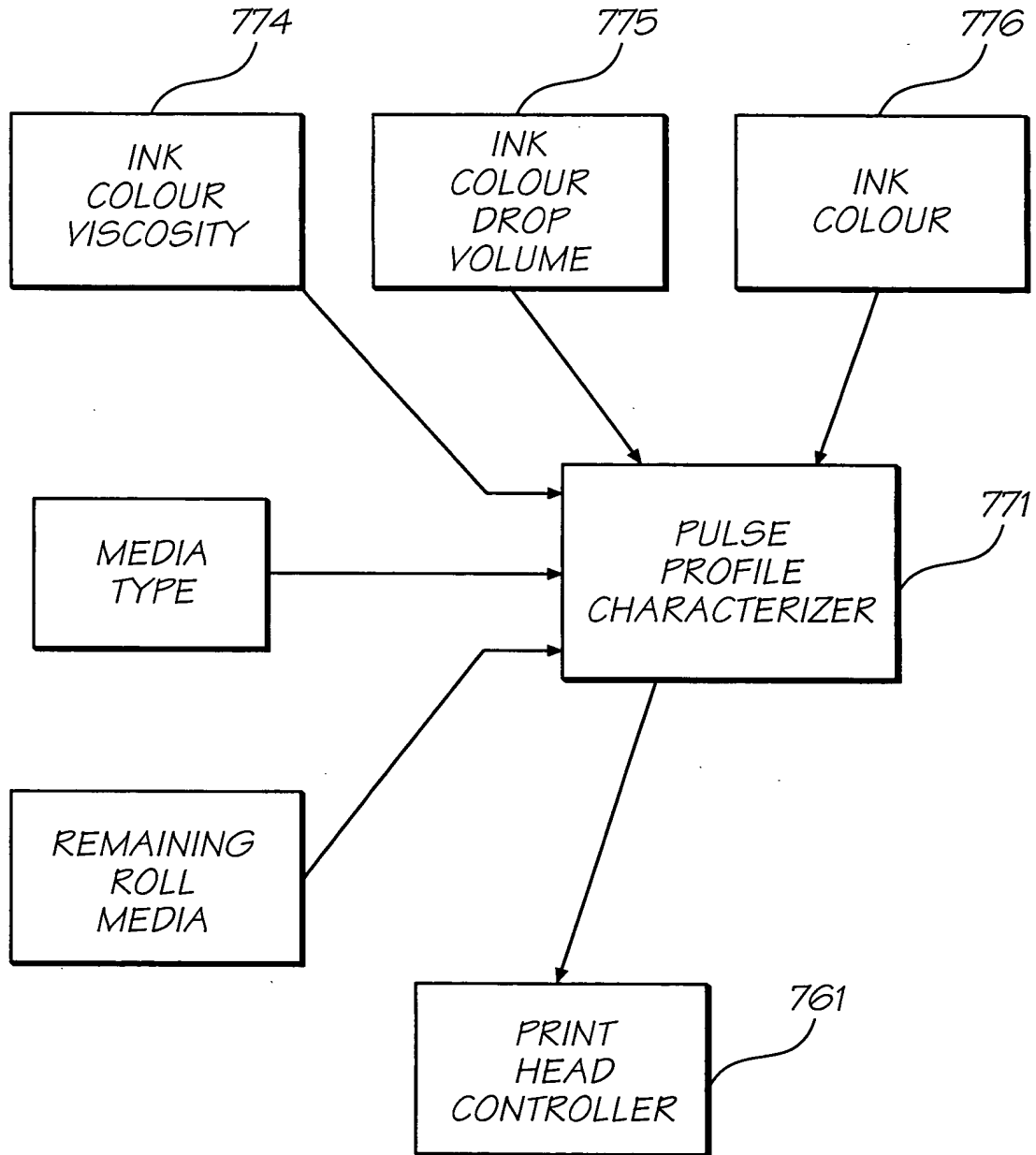


FIG. 205

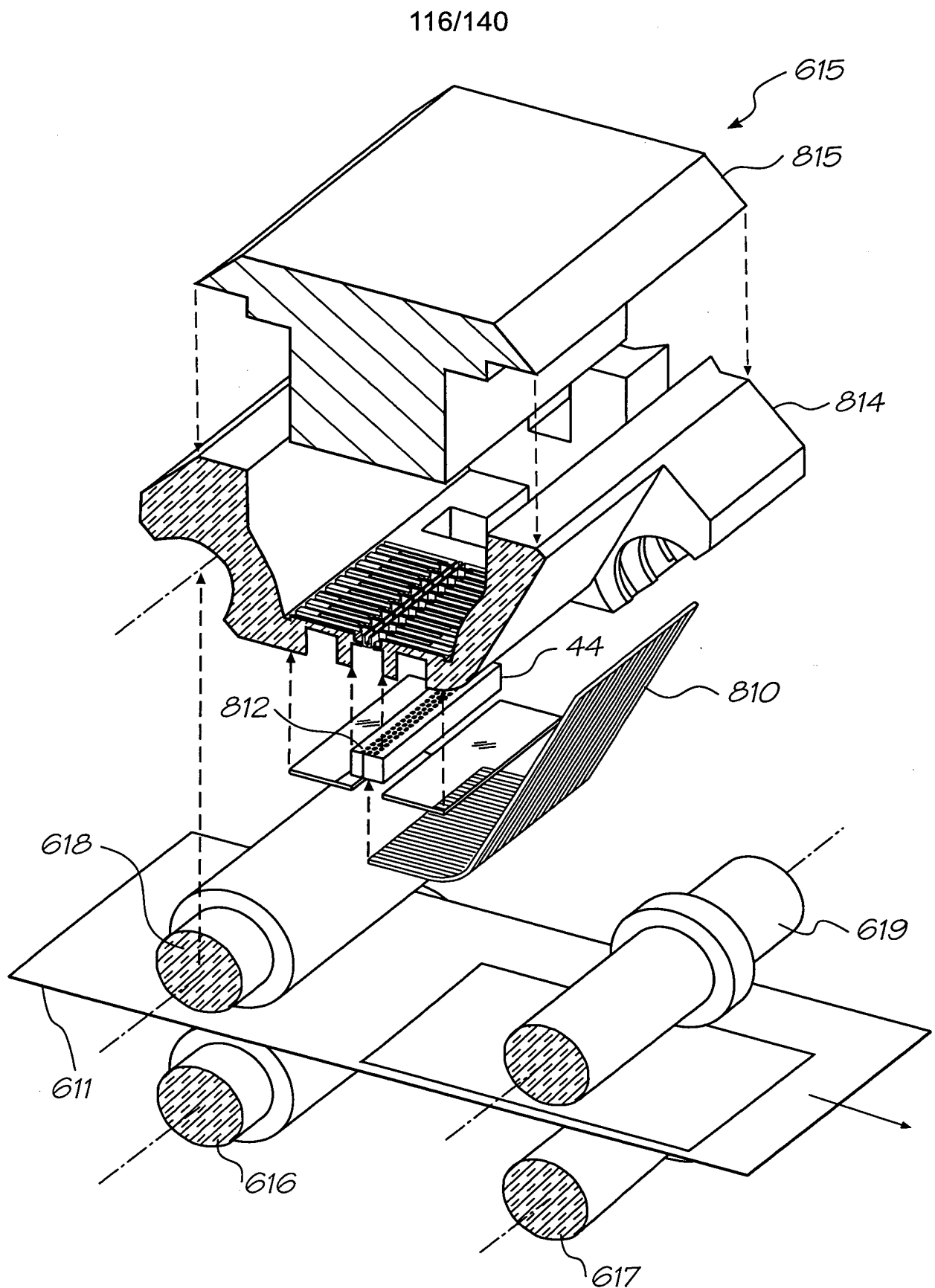


FIG. 206

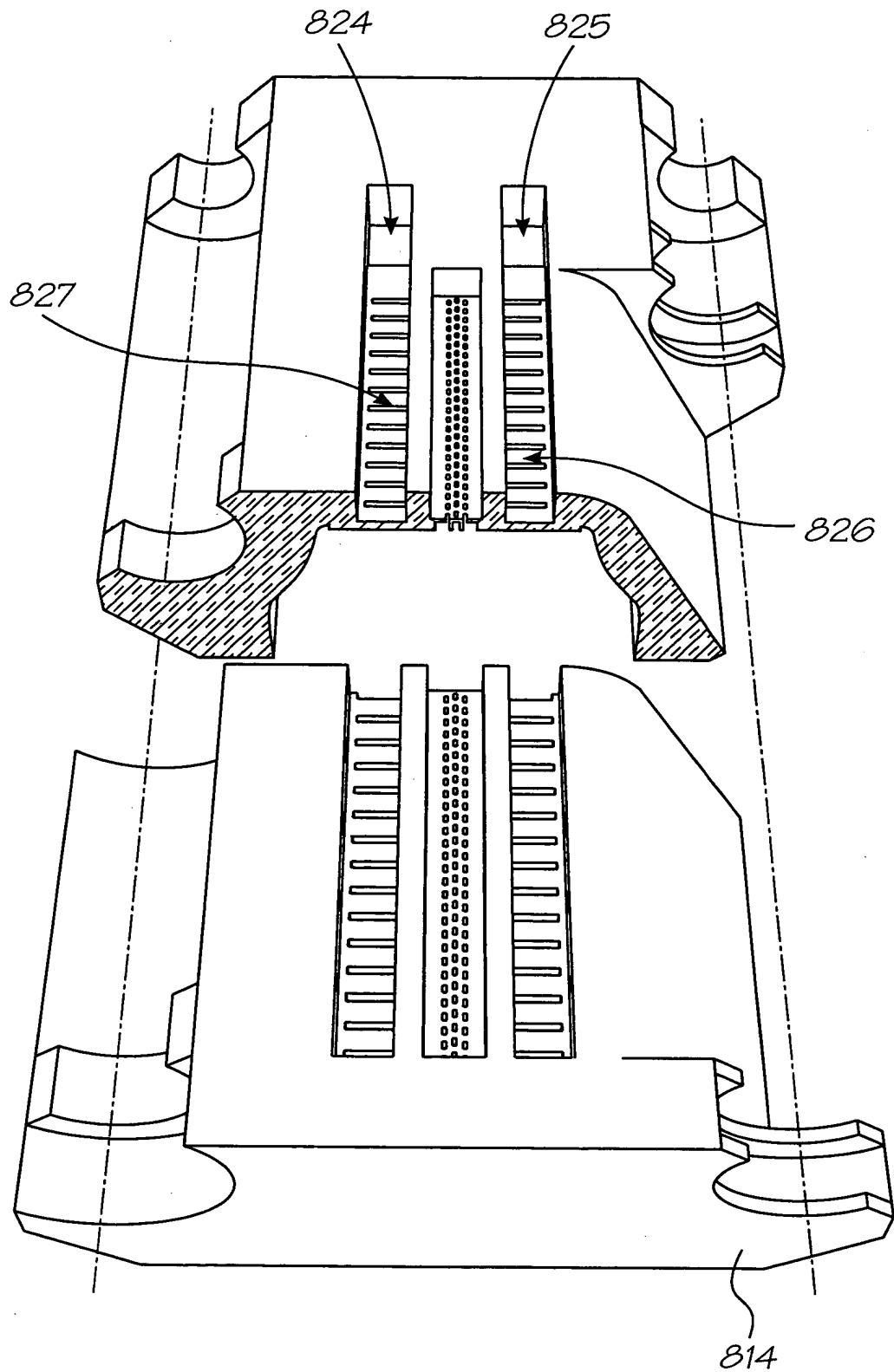


FIG. 207

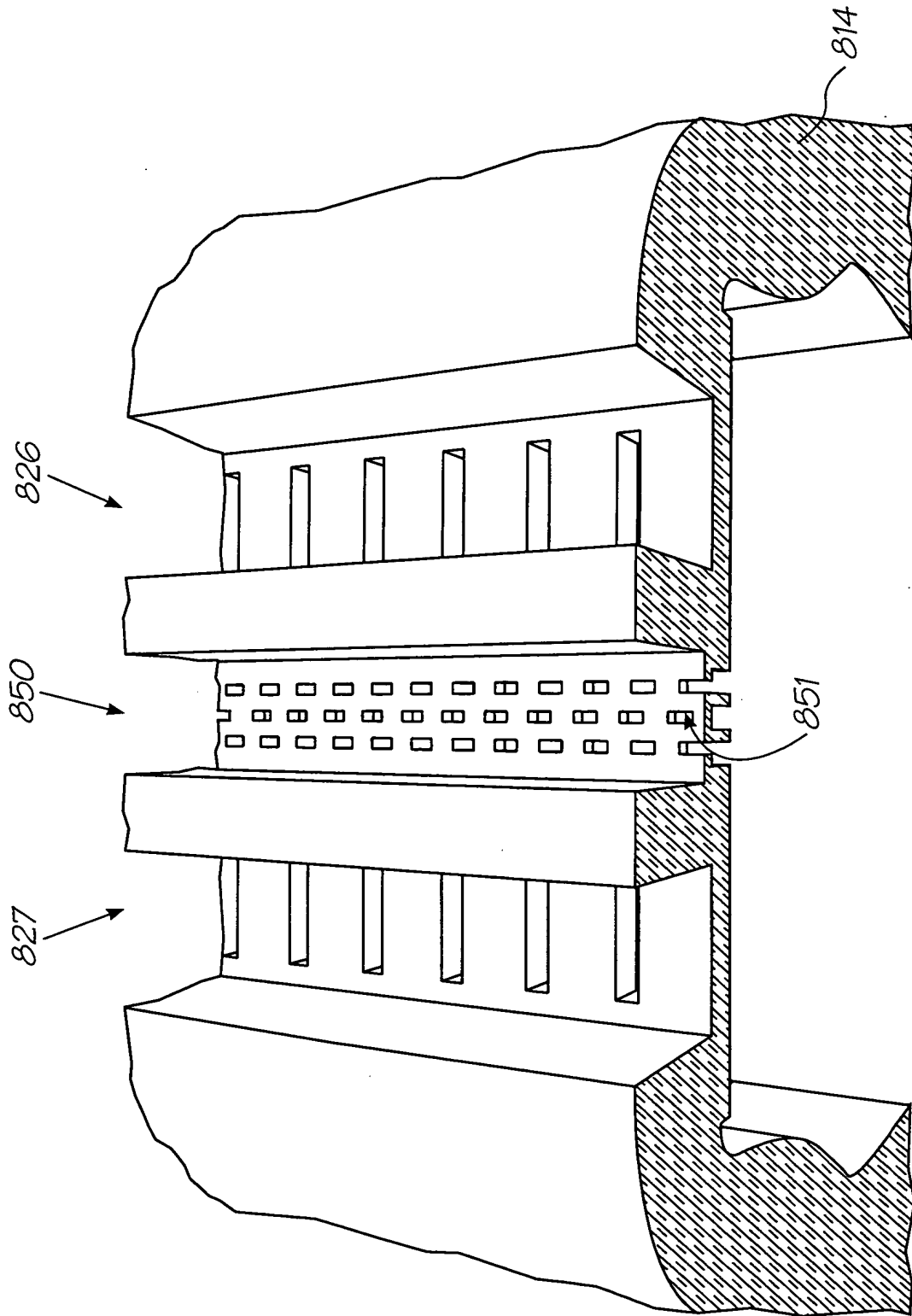


FIG. 208

119/140

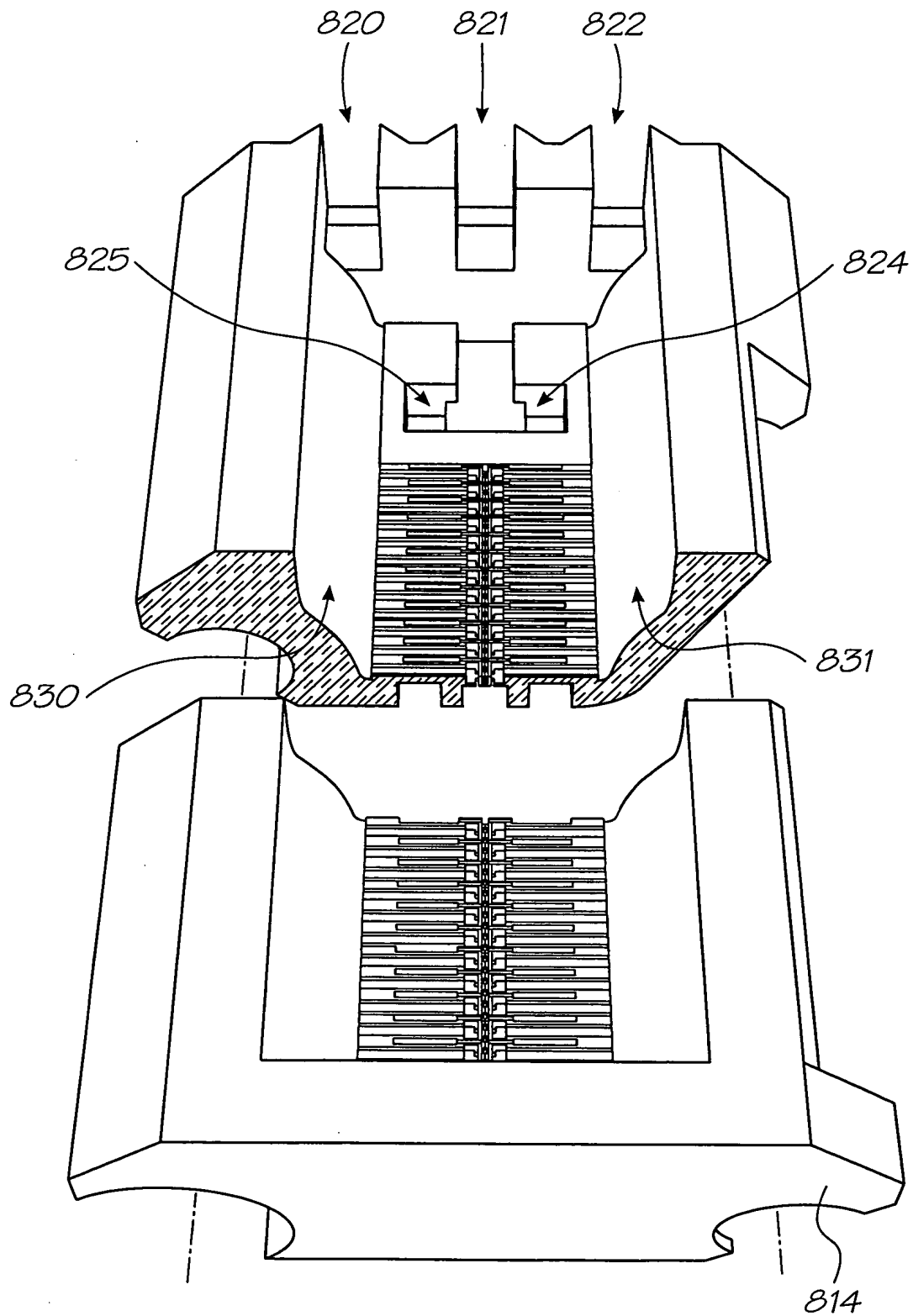


FIG. 209

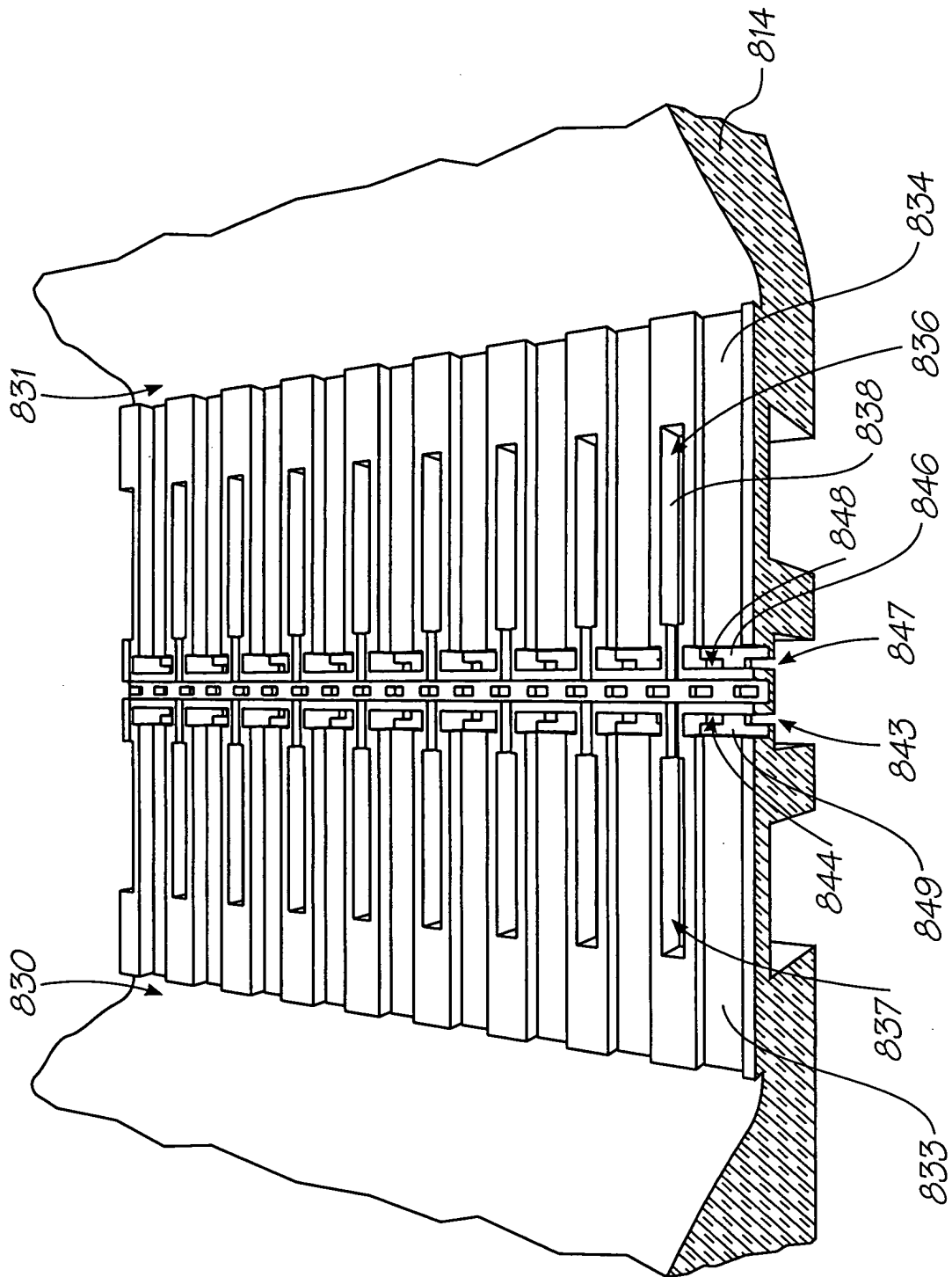


FIG. 210

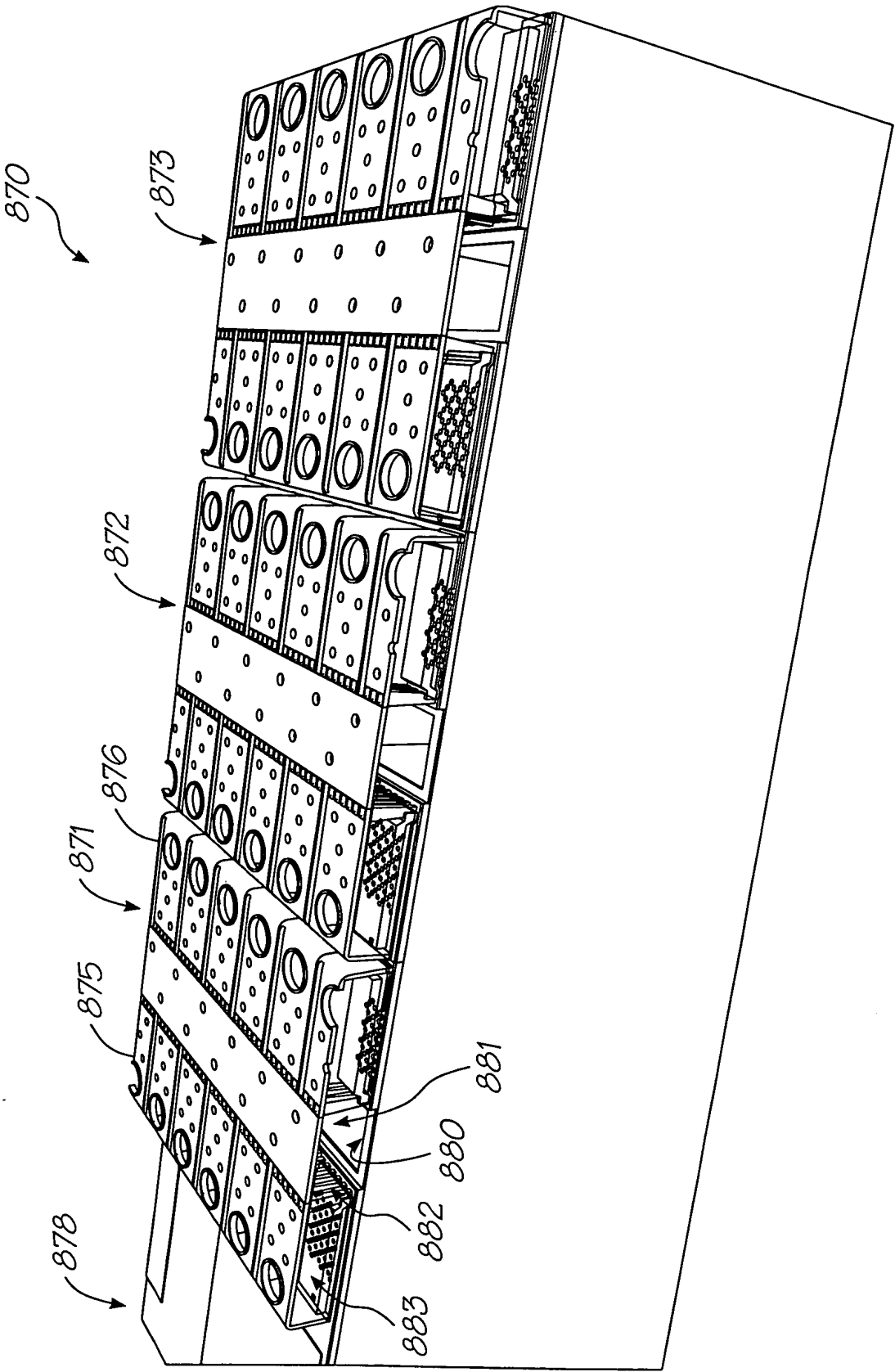


FIG. 211

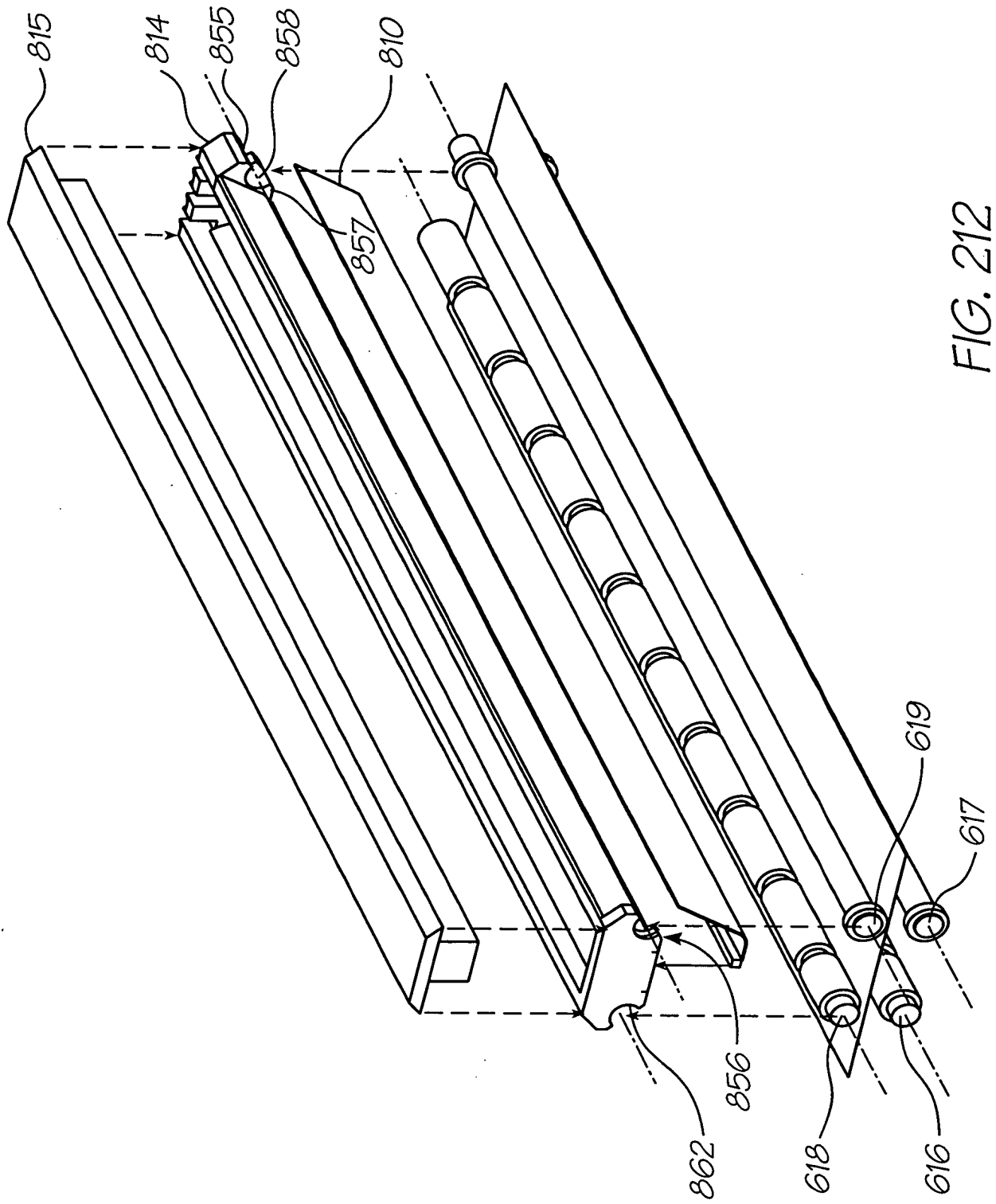


FIG. 212

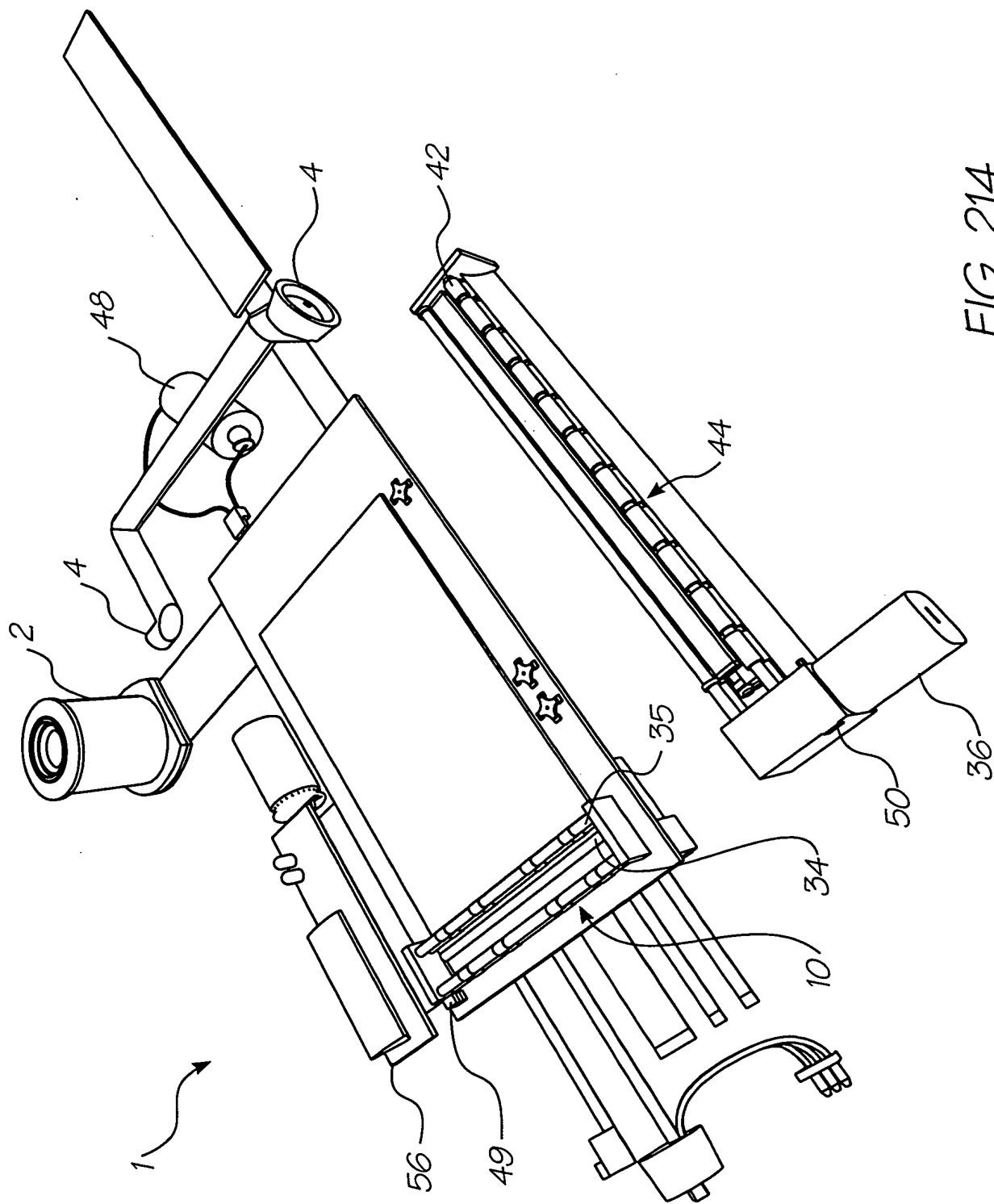


FIG. 214

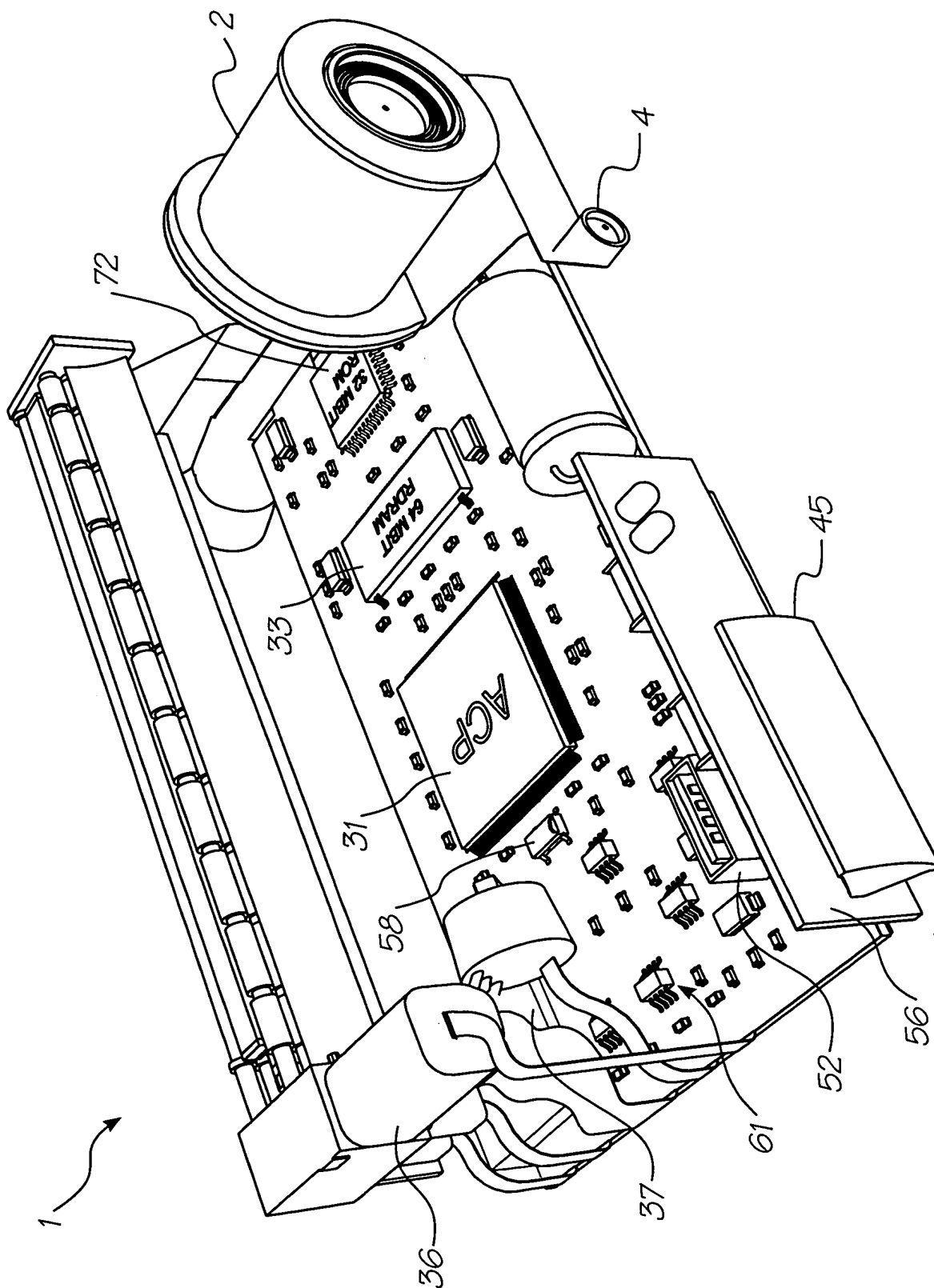


FIG. 215

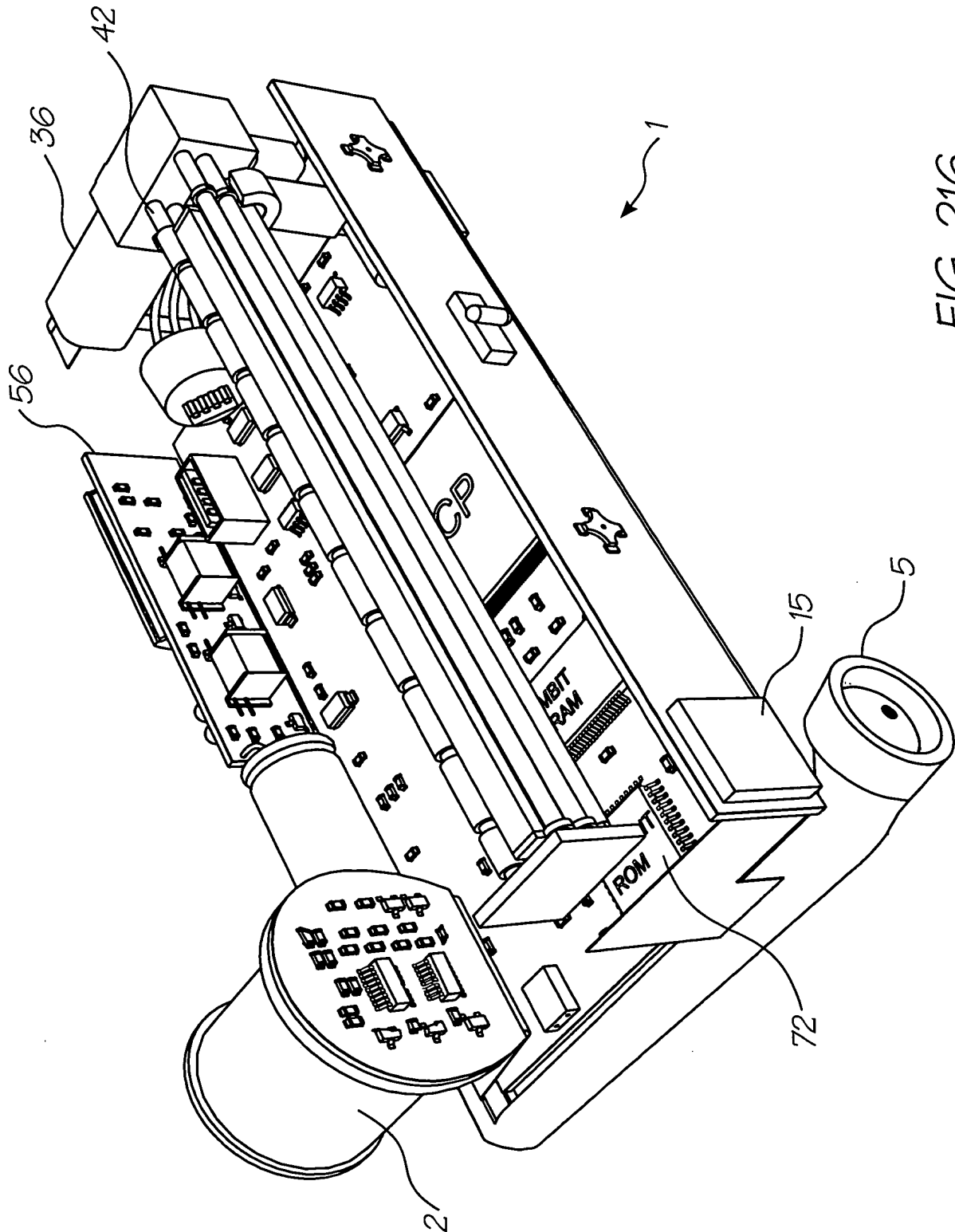


FIG. 216

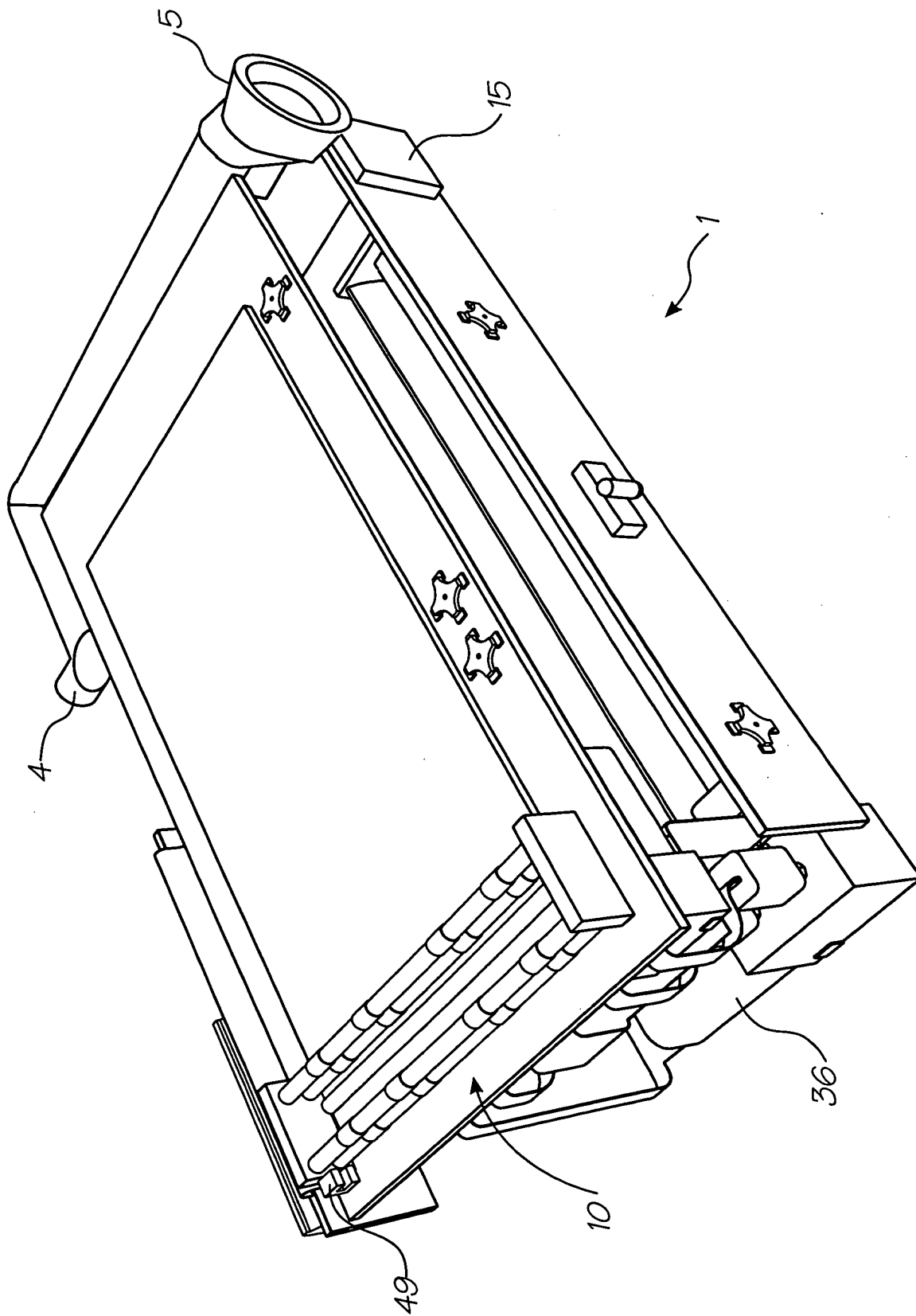


FIG. 217

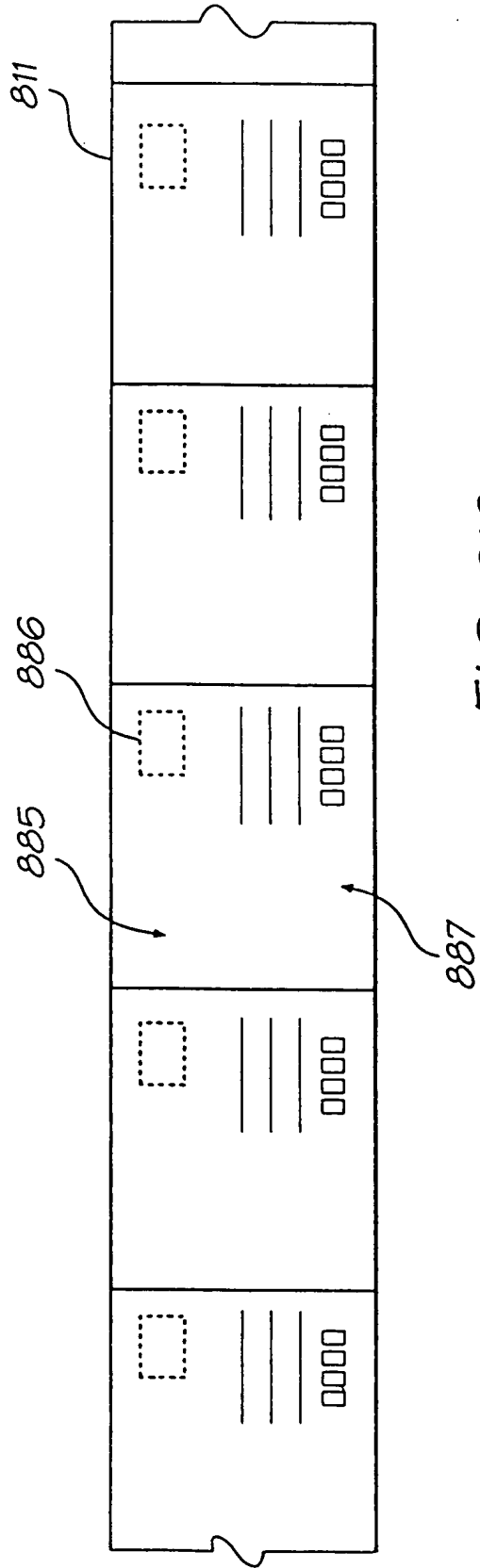


FIG. 218

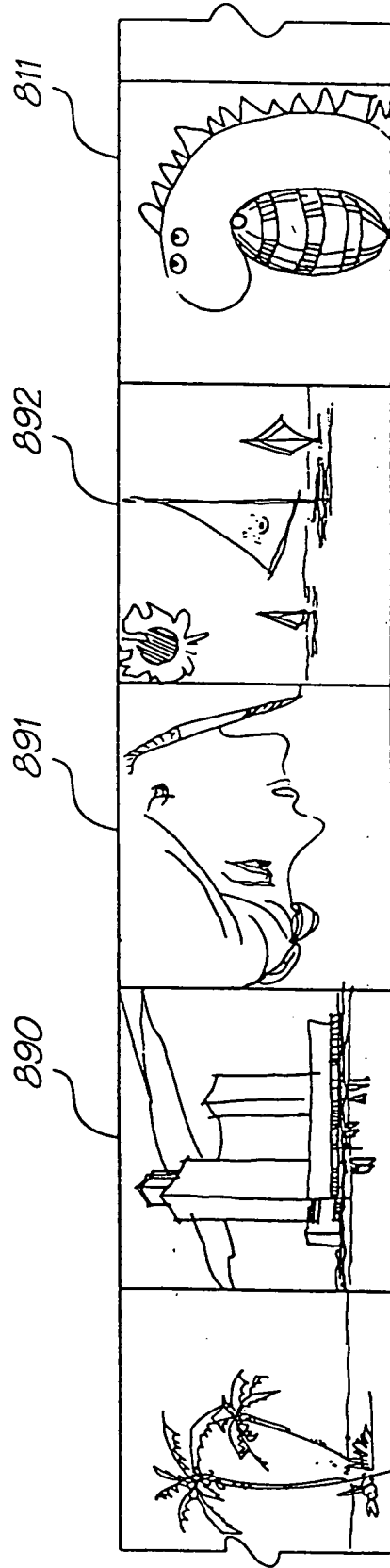


FIG. 219

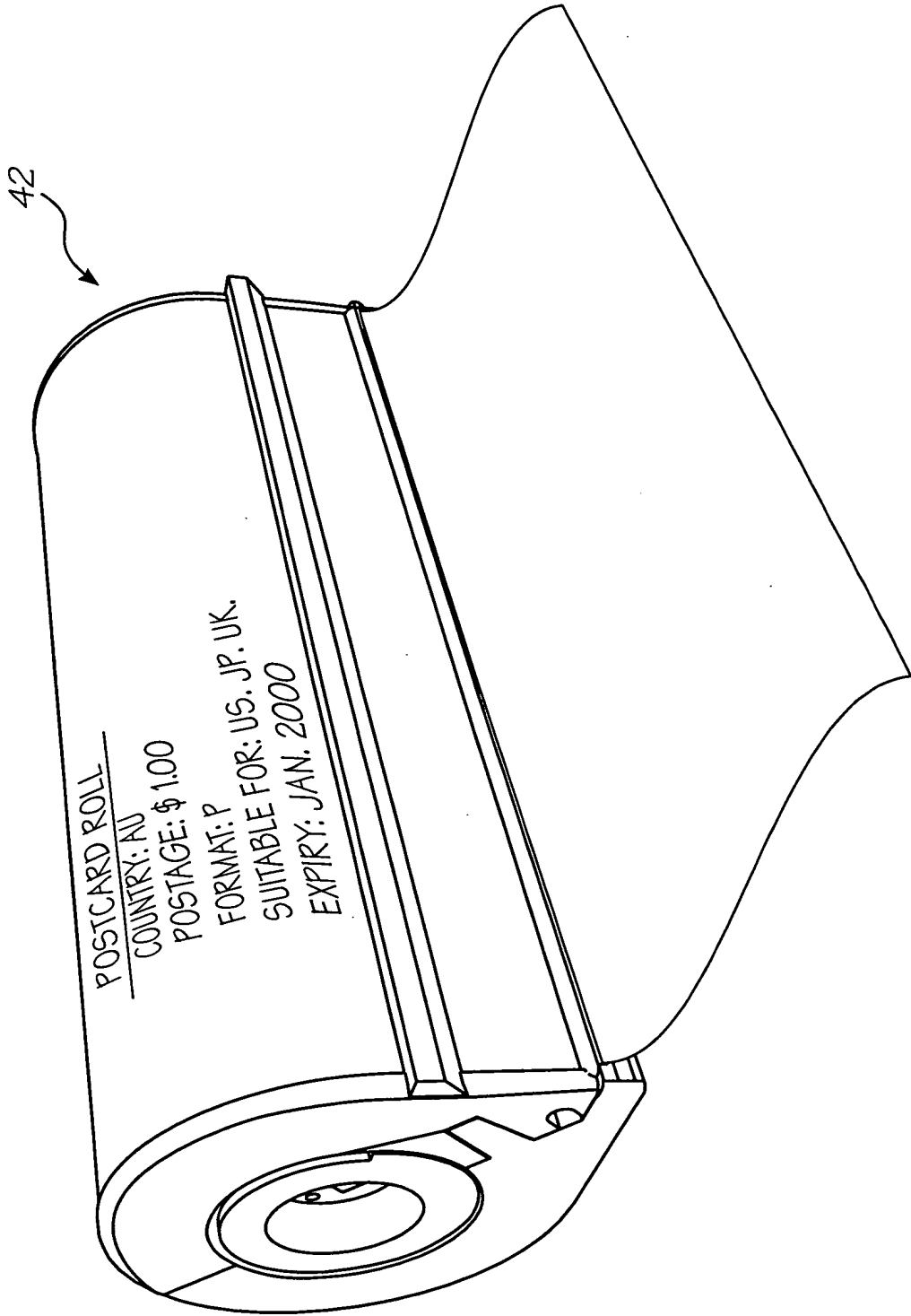


FIG. 220

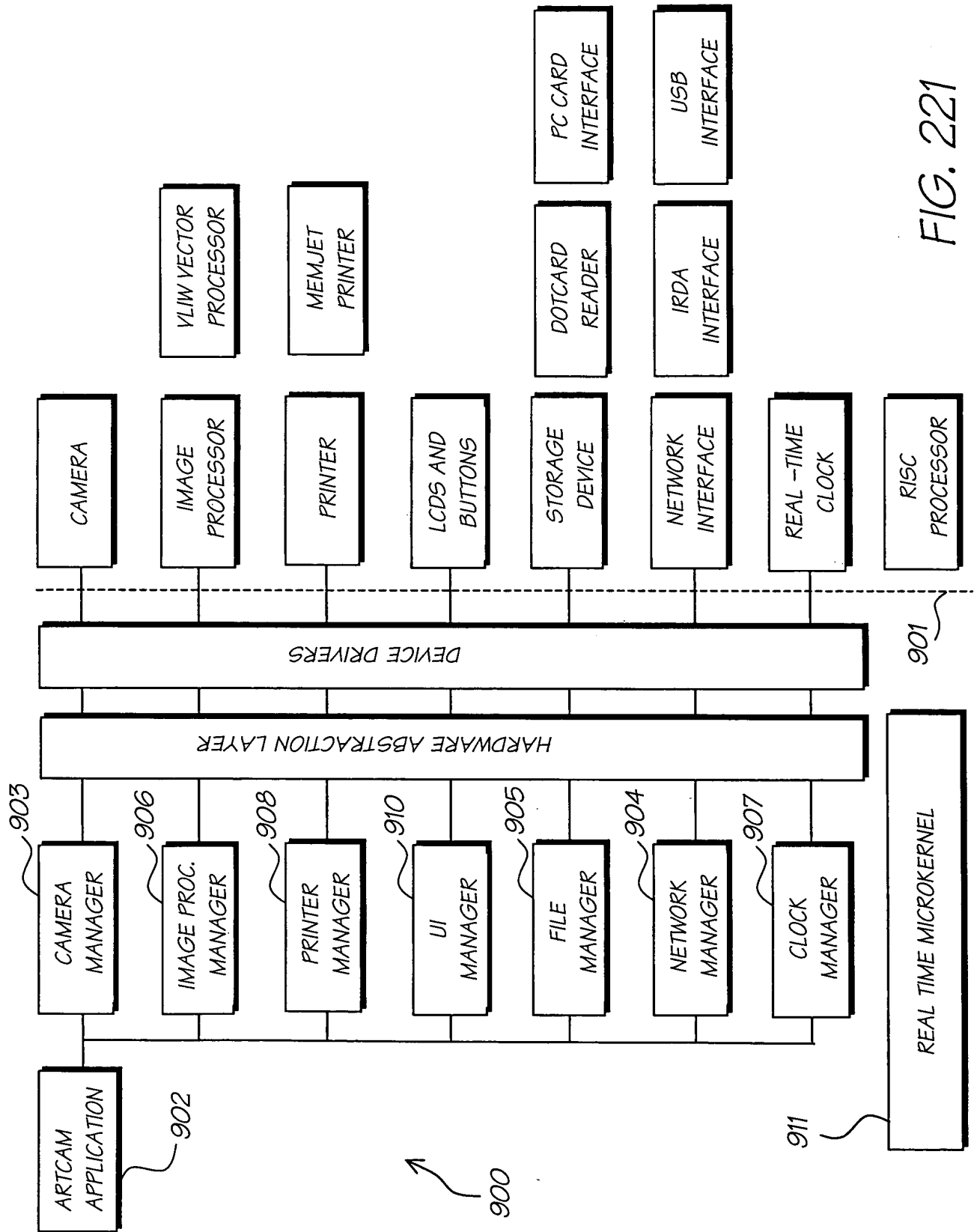


FIG. 221

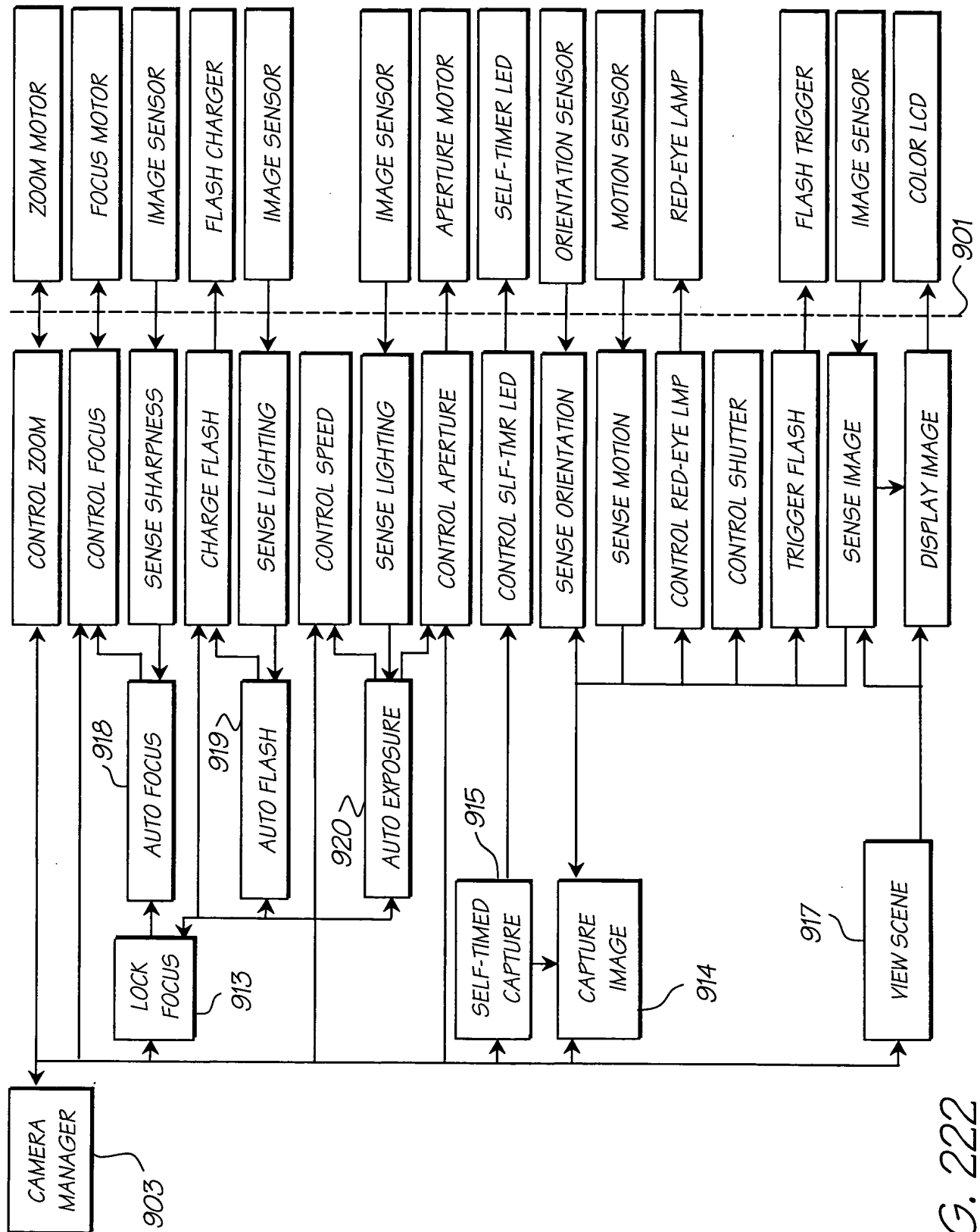


FIG. 222

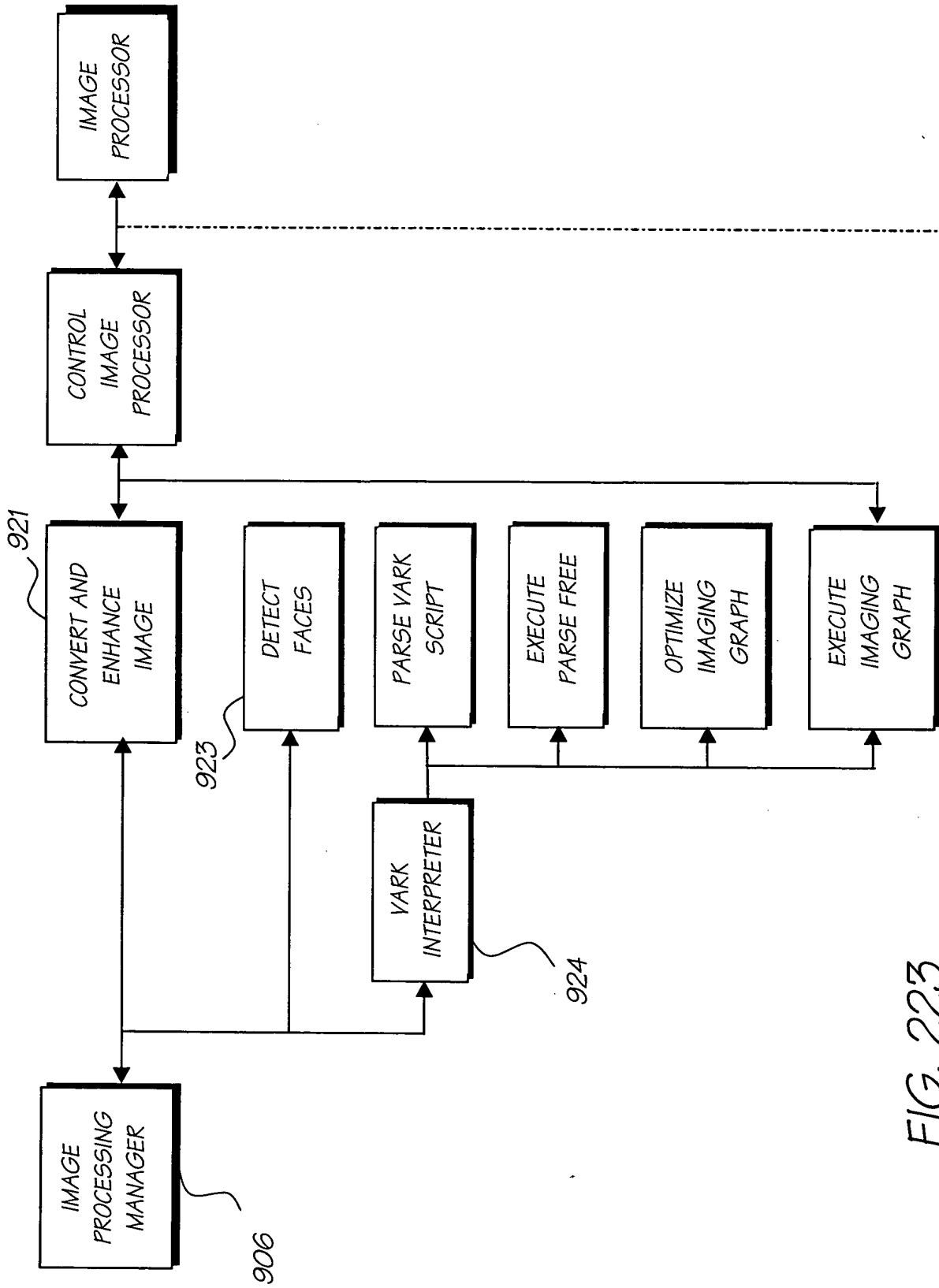


FIG. 223

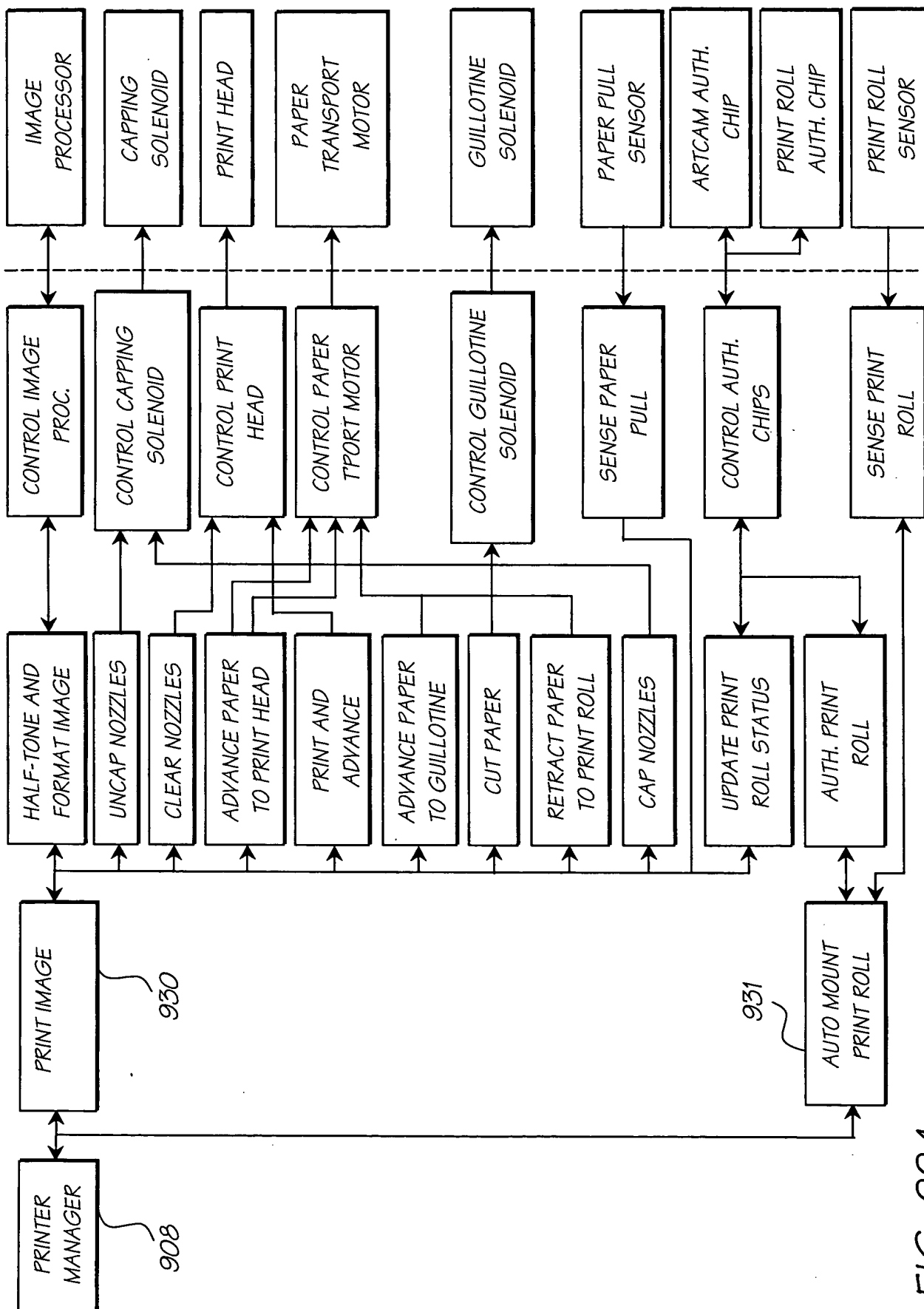


FIG. 224

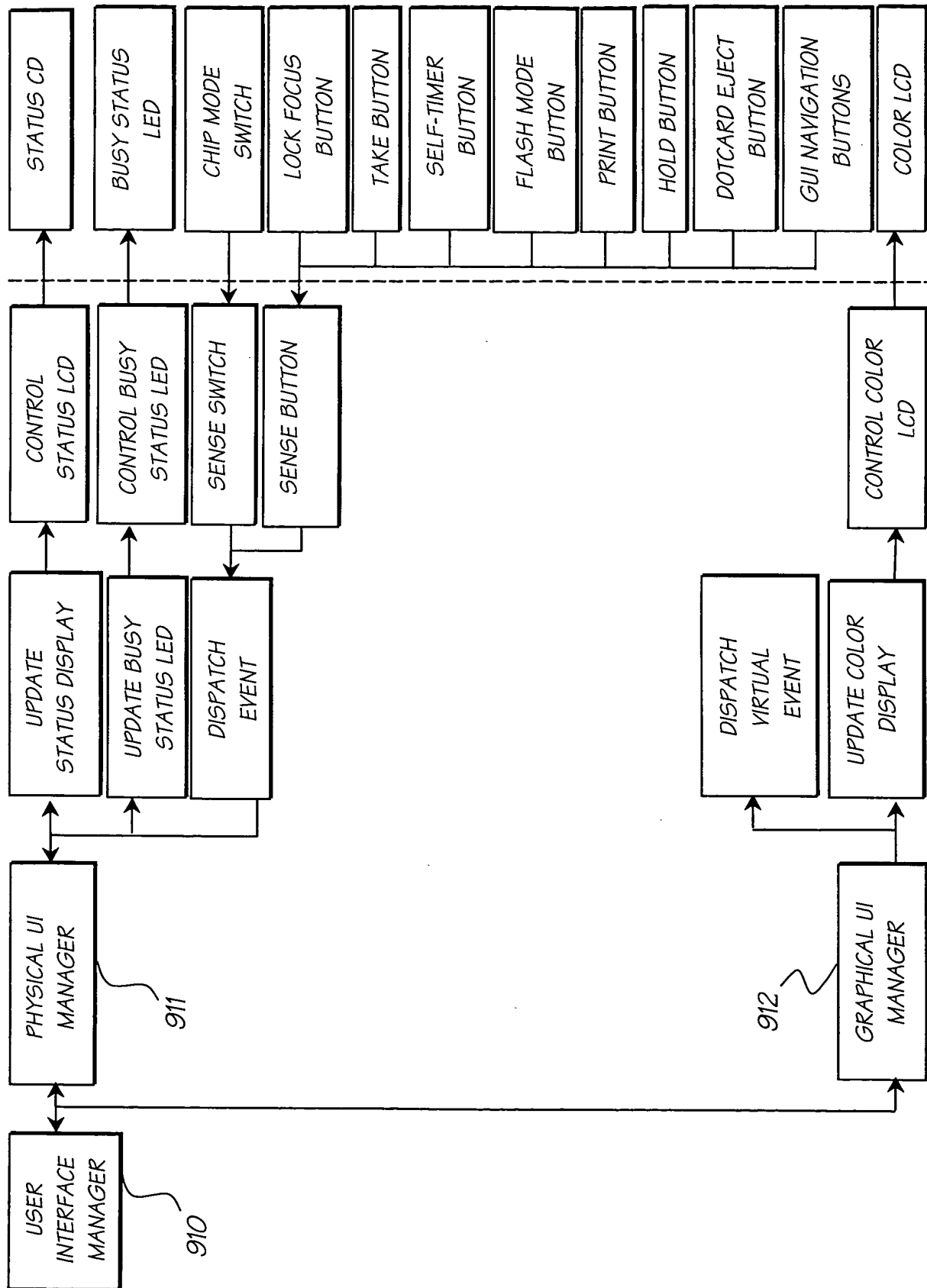


FIG. 225

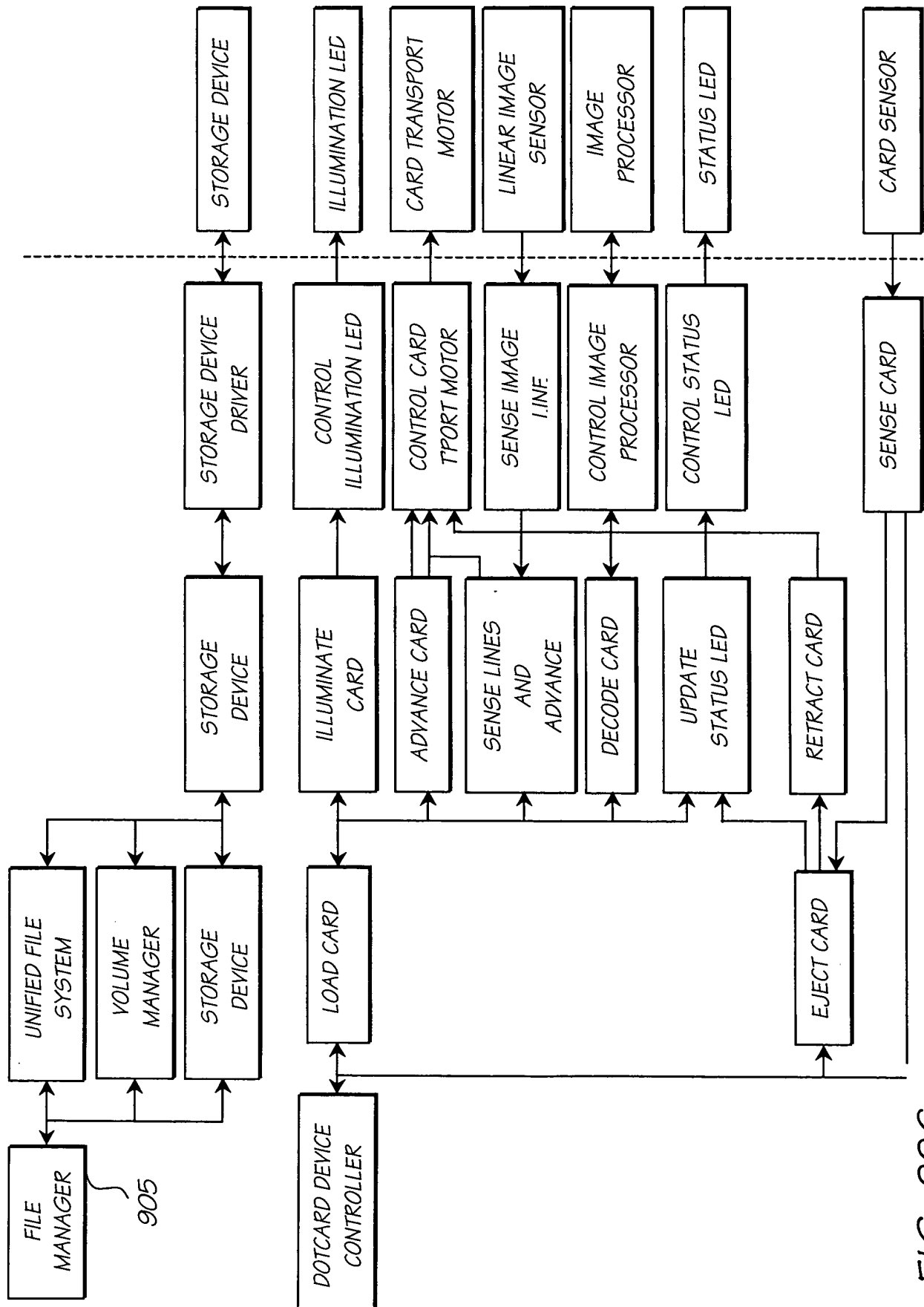
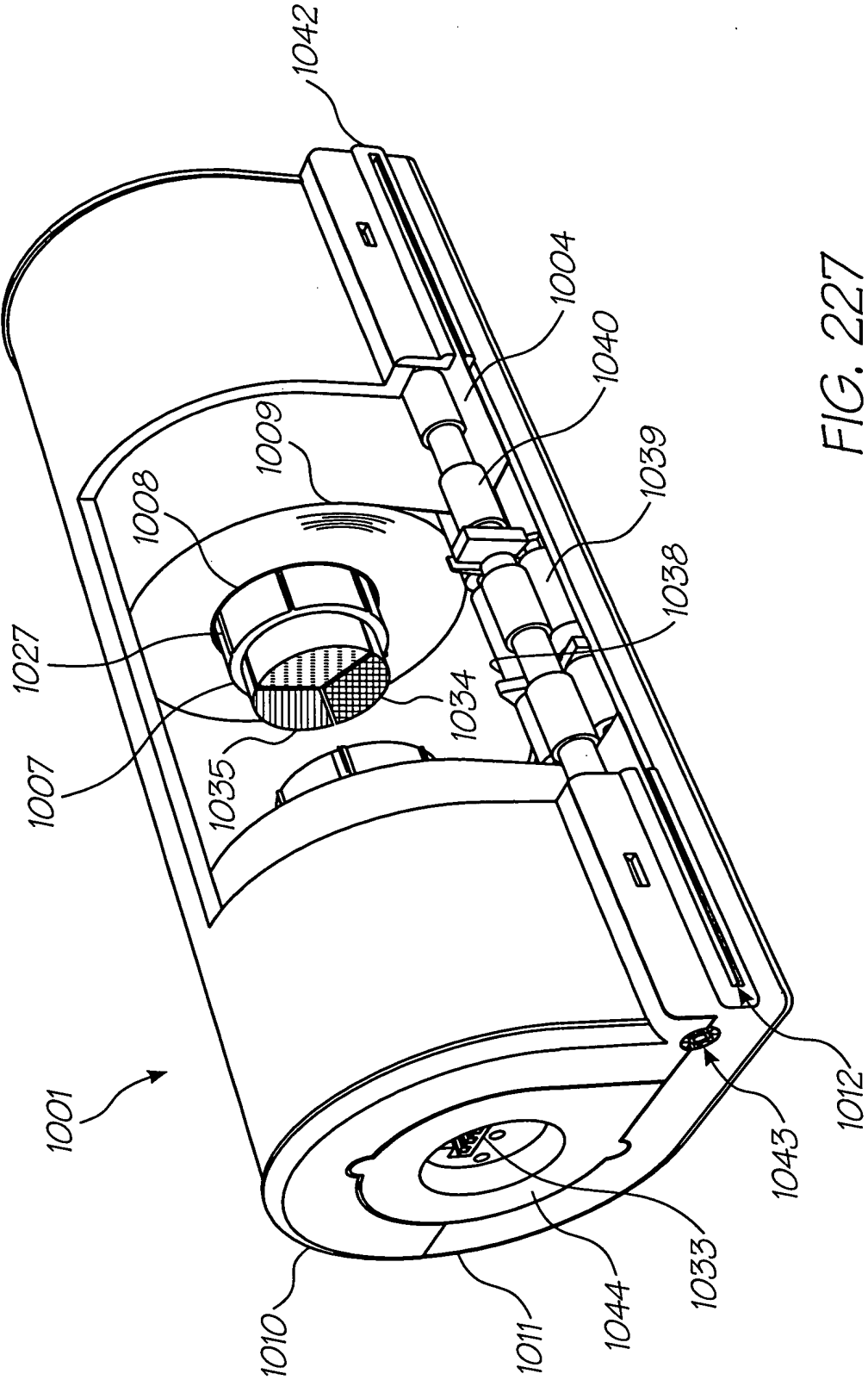


FIG. 226



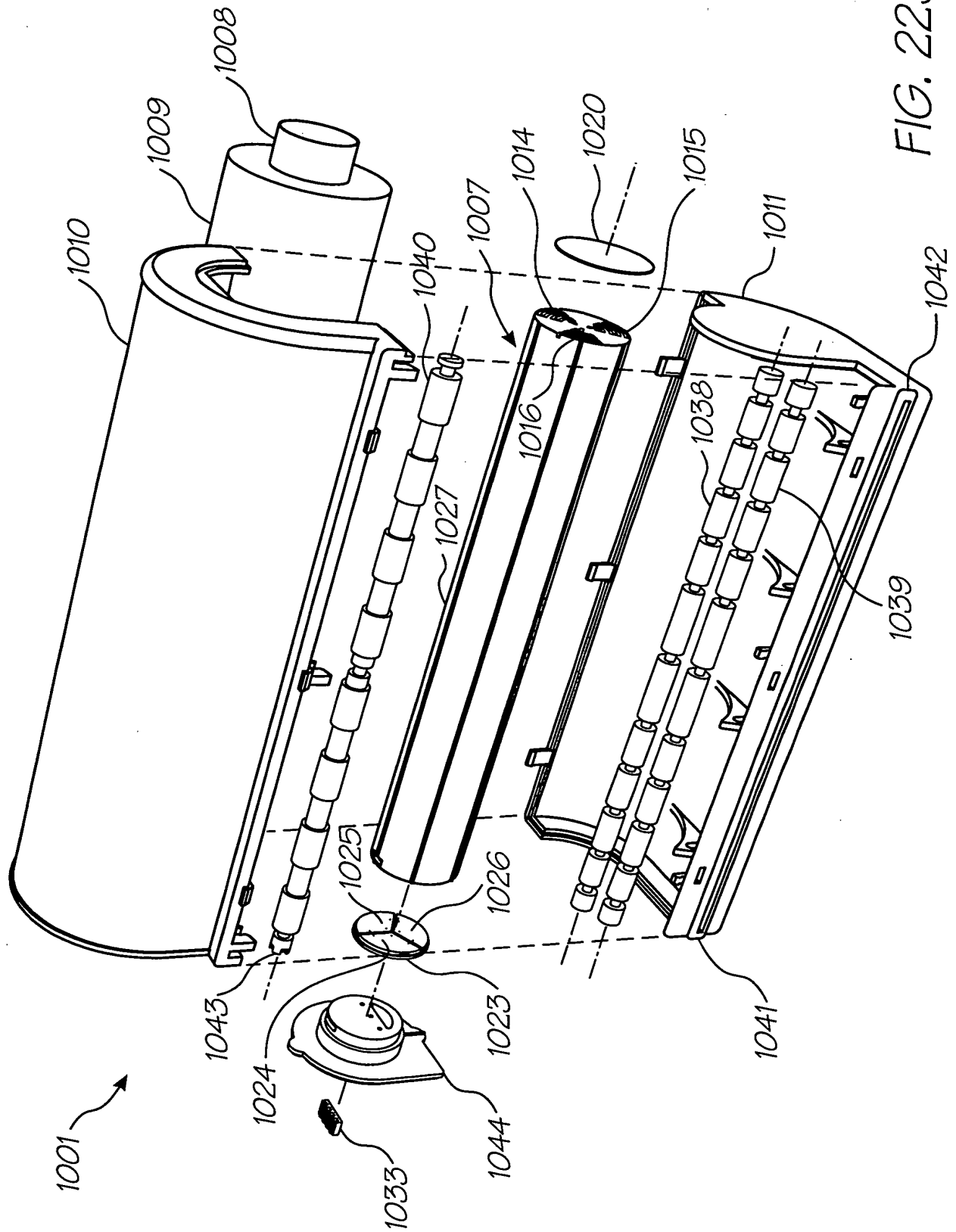


FIG. 229

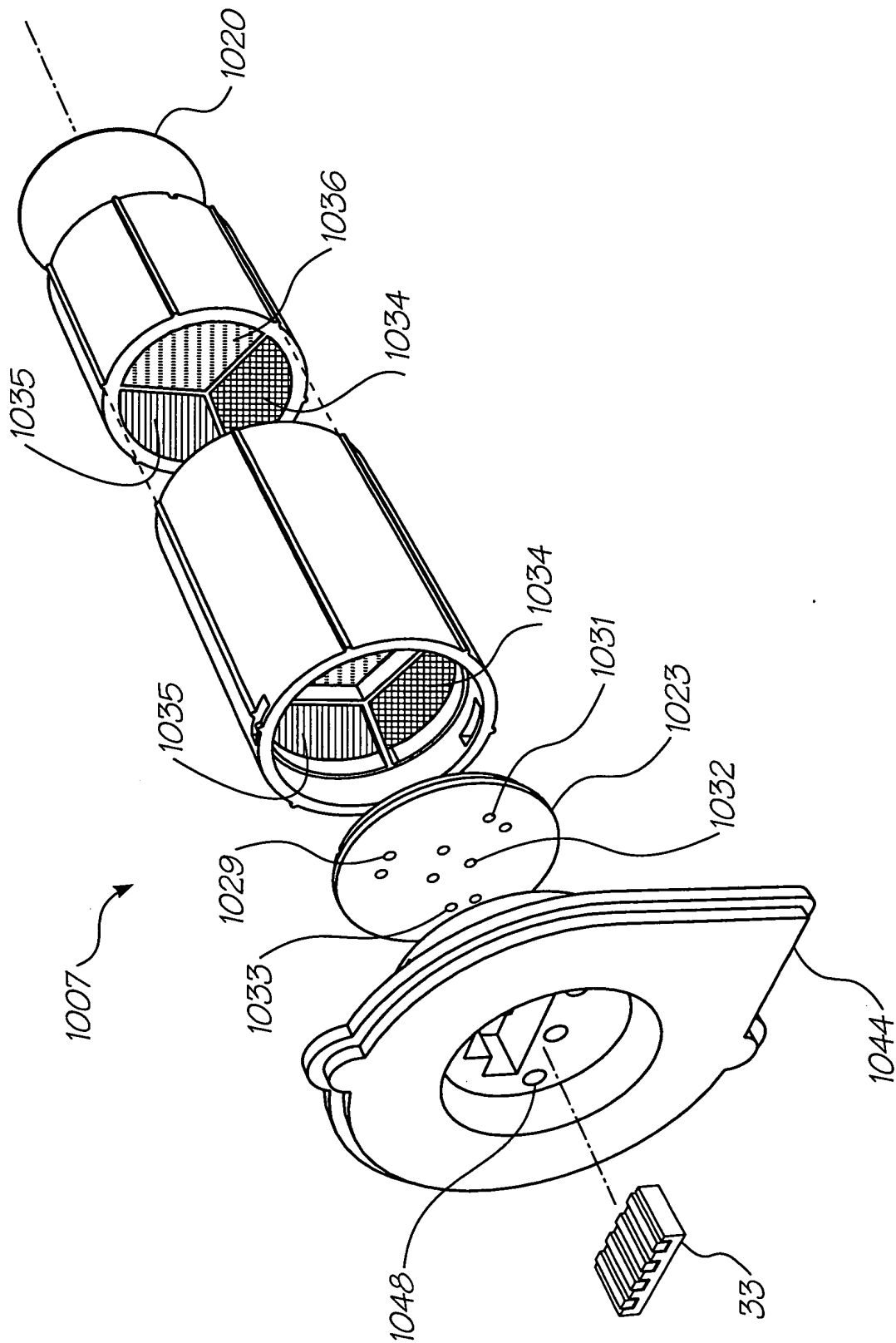


FIG. 230

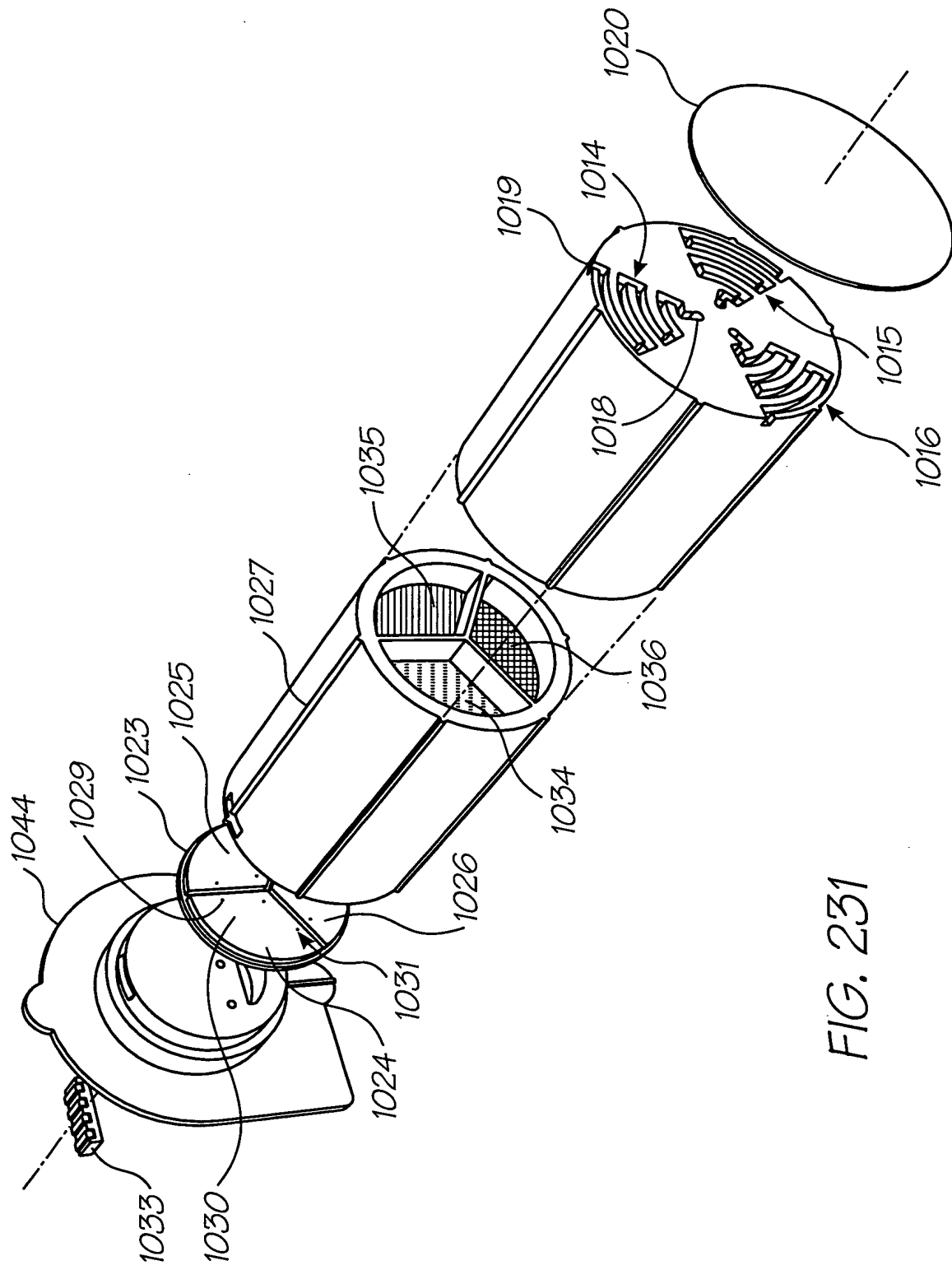


FIG. 231